

=> fil reg  
FILE 'REGISTRY' ENTERED AT 16:17:00 ON 29 NOV 2007  
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STRUCTURE FILE UPDATES: 28 NOV 2007 HIGHEST RN 956214-95-2  
DICTIONARY FILE UPDATES: 28 NOV 2007 HIGHEST RN 956214-95-2

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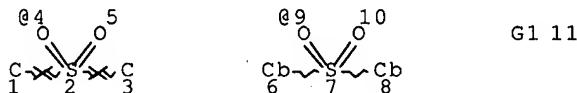
TSCA INFORMATION NOW CURRENT THROUGH June 29, 2007

Please note that search-term pricing does apply when  
conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and  
predicted properties as well as tags indicating availability of  
experimental property data in the original document. For information  
on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stndoc/properties.html>

=> d que stat 112  
L6 STR



VAR G1=4/9

NODE ATTRIBUTES:

NSPEC IS RC AT 1  
NSPEC IS RC AT 2  
NSPEC IS RC AT 3  
DEFAULT MLEVEL IS ATOM  
GGCAT IS UNS AT 6  
GGCAT IS UNS AT 8  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 11

STEREO ATTRIBUTES: NONE

L7 SCR 1781 OR 1782  
L9 553397 SEA FILE=REGISTRY SSS FUL L6 AND L7  
L10 532170 SEA FILE=REGISTRY ABB=ON PLU=ON L9 NOT PMS/CI  
L11 514406 SEA FILE=REGISTRY ABB=ON PLU=ON L10 NOT M/ELS  
L12 61062 SEA FILE=REGISTRY ABB=ON PLU=ON L11 AND (C(L)H(L)O(L)S)  
/ELS AND 4/ELC.SUB

=> d que stat 124  
L14 STR

G1 ~ N2 = N3 ~ G41      Ak @5      Cy @6

VAR G1=5/6  
 NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM  
 GGCAT IS SAT AT 5  
 GGCAT IS UNS AT 6  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 6

STEREO ATTRIBUTES: NONE  
 L16                    SCR 2108  
 L18                    SCR 1665  
 L20                    SCR 2043  
 L22    328901 SEA FILE=REGISTRY SSS FUL L14 AND L16 AND L18 NOT L20  
 L24    288089 SEA FILE=REGISTRY ABB=ON PLU=ON L22 NOT M/ELS

=> d his nofile

(FILE 'HOME' ENTERED AT 13:40:00 ON 29 NOV 2007)

FILE 'HCAPLUS' ENTERED AT 13:40:10 ON 29 NOV 2007  
 L1                    1 SEA ABB=ON PLU=ON US2004048163/PN  
                       SEL RN

FILE 'REGISTRY' ENTERED AT 13:40:46 ON 29 NOV 2007  
 L2                    54 SEA ABB=ON PLU=ON (10377-51-2/BI OR 10411-26-4/BI OR  
                       105-58-8/BI OR 105-64-6/BI OR 105-74-8/BI OR 108-32-7/BI  
                       OR 108-88-3/BI OR 108-90-7/BI OR 126-33-0/BI OR 126-58-9/  
                       BI OR 127-63-9/BI OR 131651-65-5/BI OR 1330-20-7/BI OR  
                       14024-11-4/BI OR 14283-07-9/BI OR 14666-78-5/BI OR  
                       149-32-6/BI OR 15520-11-3/BI OR 1561-49-5/BI OR 162684-16  
                       -4/BI OR 1712-87-4/BI OR 18424-17-4/BI OR 193215-00-8/BI  
                       OR 21324-40-3/BI OR 26748-41-4/BI OR 27359-10-0/BI OR  
                       28452-93-9/BI OR 29935-35-1/BI OR 3006-82-4/BI OR  
                       32752-09-3/BI OR 33454-82-9/BI OR 35363-40-7/BI OR  
                       39300-70-4/BI OR 4437-85-8/BI OR 462-06-6/BI OR 502-44-3/  
                       BI OR 56-81-5/BI OR 56525-42-9/BI OR 616-38-6/BI OR  
                       620-32-6/BI OR 623-53-0/BI OR 623-96-1/BI OR 67-71-0/BI  
                       OR 71-43-2/BI OR 77-77-0/BI OR 7790-99-0/BI OR 7791-03-9/  
                       BI OR 78-67-1/BI OR 79-10-7/BI OR 90076-65-6/BI OR  
                       92177-99-6/BI OR 94-36-0/BI OR 96-49-1/BI OR 98-95-3/BI)  
                       D SCA

L3                    9 SEA ABB=ON PLU=ON L2 AND S/ELS  
                       D SCA

L4                    3 SEA ABB=ON PLU=ON L2 AND N/ELS  
                       D SCA

FILE 'HCAPLUS' ENTERED AT 13:55:39 ON 29 NOV 2007  
 L5                    1 SEA ABB=ON PLU=ON L1 AND L3  
                       D HITSTR

FILE 'LREGISTRY' ENTERED AT 14:01:04 ON 29 NOV 2007

L6 STR

FILE 'REGISTRY' ENTERED AT 14:03:49 ON 29 NOV 2007

L7 SCR 1781 OR 1782

L8 50 SEA SSS SAM L6 AND L7

L9 553397 SEA SSS FUL L6 AND L7

L10 532170 SEA ABB=ON PLU=ON L9 NOT PMS/CI

L11 514406 SEA ABB=ON PLU=ON L10 NOT M/ELS

L12 61062 SEA ABB=ON PLU=ON L11 AND (C(L)H(L)O(L)S)/ELS AND 4/ELC.SUB

L13 6 SEA ABB=ON PLU=ON L2 AND L12  
SAV TEMP L12 WEI086A/A

FILE 'STNGUIDE' ENTERED AT 15:02:25 ON 29 NOV 2007

FILE 'LREGISTRY' ENTERED AT 15:03:08 ON 29 NOV 2007

L14 STR

FILE 'REGISTRY' ENTERED AT 15:07:15 ON 29 NOV 2007

L15 50 SEA SSS SAM L14

L16 SCR 2108

L17 50 SEA SSS SAM L14 AND L16

L18 SCR 1665

L19 50 SEA SSS SAM L14 AND L16 AND L18

L20 SCR 2043

L21 50 SEA SSS SAM L14 AND L16 AND L18 NOT L20

L22 328901 SEA SSS FUL L14 AND L16 AND L18 NOT L20

L23 1 SEA ABB=ON PLU=ON L2 AND L22

L24 288089 SEA ABB=ON PLU=ON L22 NOT M/ELS  
SAV TEMP L24 WEI086B/A

L25 1 SEA ABB=ON PLU=ON L2 AND C6H1006/MF

L26 1 SEA ABB=ON PLU=ON L2 AND C18H34O4/MF

L27 1 SEA ABB=ON PLU=ON L2 AND C8H14O6/MF

L28 1 SEA ABB=ON PLU=ON L2 AND C14H22O6/MF

L29 1 SEA ABB=ON PLU=ON L2 AND C12H24O3/MF

L30 1 SEA ABB=ON PLU=ON L2 AND C22H38O6/MF

L31 1 SEA ABB=ON PLU=ON L2 AND C8H18O2/MF

L32 1 SEA ABB=ON PLU=ON L2 AND C24H46O4/MF

L33 1 SEA ABB=ON PLU=ON L2 AND C14H10O4/MF

L34 1 SEA ABB=ON PLU=ON L2 AND C16H14O4/MF

L35 10 SEA ABB=ON PLU=ON (L25 OR L26 OR L27 OR L28 OR L29 OR L30 OR L31 OR L32 OR L33 OR L34)

FILE 'HCAPLUS' ENTERED AT 15:44:00 ON 29 NOV 2007

L36 40822 SEA ABB=ON PLU=ON L12

L37 124918 SEA ABB=ON PLU=ON L24

L38 14440 SEA ABB=ON PLU=ON L35

L39 QUE ABB=ON PLU=ON AZO?

L40 QUE ABB=ON PLU=ON ?PEROX?

L41 2947 SEA ABB=ON PLU=ON L36 AND (L37 OR L38 OR L39 OR L40)

L42 QUE ABB=ON PLU=ON ELECTROLY?

L43 50 SEA ABB=ON PLU=ON L41 AND L42

L44 QUE ABB=ON PLU=ON (LI OR LITHIUM) (3A) BATTER?

L45 QUE ABB=ON PLU=ON (LI OR LITHIUM) (2A) SALT

L46 8872 SEA ABB=ON PLU=ON L23

L47 15 SEA ABB=ON PLU=ON L43 AND (L44 OR L45)

L48 7 SEA ABB=ON PLU=ON L47 AND L38

L49 5 SEA ABB=ON PLU=ON L47 AND L46

L50 QUE ABB=ON PLU=ON WT## OR WEIGHT?

L51 0 SEA ABB=ON PLU=ON L47 AND L50

L52 15 SEA ABB=ON PLU=ON L47 OR L48 OR L49  
 L53 3 SEA ABB=ON PLU=ON L48 AND L49  
 L54 12 SEA ABB=ON PLU=ON L52 NOT L53

=> fil hcap  
 FILE 'HCAPLUS' ENTERED AT 16:17:10 ON 29 NOV 2007  
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 FILE LAST UPDATED: 28 Nov 2007 (20071128/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d 153 ibib abs hitstr hitind 1-3

L53 ANSWER 1 OF 3 HCAPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2007:41382 HCAPLUS Full-text  
 DOCUMENT NUMBER: 146:145946  
 TITLE: **Electrolyte for lithium secondary battery**  
 INVENTOR(S): Kim, Cheonsoo  
 PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 11pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2007009806	A1	20070111	US 2006-481911	200607 07
KR 2007006253	A	20070111	KR 2005-61409	200507 07
PRIORITY APPLN. INFO.:			KR 2005-61409	A 200507 07

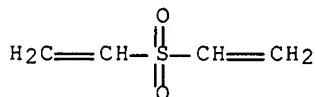
OTHER SOURCE(S): MARPAT 146:145946

AB The invention concerns an **electrolyte** for a lithium secondary **battery** and a lithium secondary **battery** having the **electrolyte**, the **electrolyte** including a lithium **salt**; a non-aqueous organic solvent including  $\gamma$ -butyrolactone-; and a succinic anhydride.

IT 77-77-0, Divinyl sulfone  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte for lithium secondary  
 battery)

RN 77-77-0 HCAPLUS

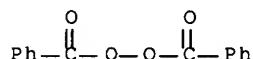
CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)



IT 94-36-0, Dibenzoyl **peroxide**, reactions  
 105-64-6, Di-isopropyl **peroxydicarbonate**  
 105-74-8, Dilauroyl **peroxide** 3006-82-4,  
 tert-**Butylperoxy**-2-ethyl hexanoate 15520-11-3,  
 Bis(4-tert-butylcyclohexyl) **peroxydicarbonate**  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (electrolyte for lithium secondary  
 battery)

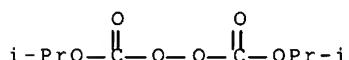
RN 94-36-0 HCAPLUS

CN Peroxide, dibenzoyl (CA INDEX NAME)



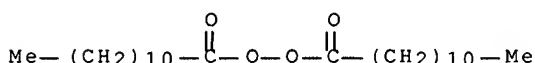
RN 105-64-6 HCAPLUS

CN Peroxydicarbonic acid, C,C'-bis(1-methylethyl) ester (CA INDEX NAME)



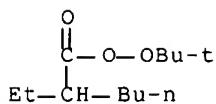
RN 105-74-8 HCAPLUS

CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



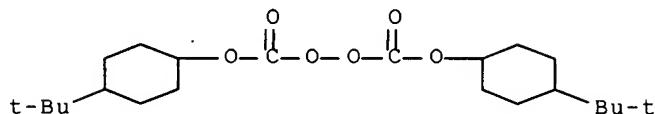
RN 3006-82-4 HCAPLUS

CN Hexaneperoxyic acid, 2-ethyl-, 1,1-dimethylethyl ester (CA INDEX NAME)



RN 15520-11-3 HCAPLUS

CN Peroxydicarbonic acid, C,C'-bis[4-(1,1-dimethylethyl)cyclohexyl] ester (CA INDEX NAME)



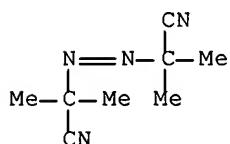
IT 78-67-1, 2,2'-Azo-bis(isobutyronitrile)

4419-11-8, 2,2'-Azo-bis(2,4-dimethyl valeronitrile)

RL: TEM (Technical or engineered material use); USES (Uses)  
(electrolyte for lithium secondary battery)

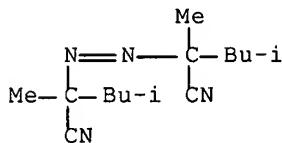
RN 78-67-1 HCAPLUS

CN Propanenitrile, 2,2'-(1,2-diazenediyi)bis[2-methyl- (CA INDEX NAME)



RN 4419-11-8 HCAPLUS

CN Pentanenitrile, 2,2'-(1,2-diazenediyi)bis[2,4-dimethyl- (CA INDEX NAME)



INCL 429329000; 429332000; 429200000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST electrolyte lithium secondary battery

IT Battery electrolytes  
(electrolyte for lithium secondary battery)

IT Aromatic hydrocarbons, uses  
Esters, uses

Ethers, uses  
 Ketones, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (electrolyte for lithium secondary  
 battery)

IT Secondary batteries  
 (lithium; electrolyte for lithium  
 secondary battery)

IT 77-77-0, Divinyl sulfone 96-48-0,  $\gamma$ -Butyrolactone  
 108-30-5, Succinic anhydride, uses 872-36-6, Vinylene carbonate  
 3741-38-6, Ethylene sulfite 25721-76-0, Poly(ethylene  
 glycol)dimethacrylate 26570-48-9, Poly(ethylene glycol)diacrylate  
 413569-08-1 919110-87-5  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte for lithium secondary  
 battery)

IT 94-36-0, Dibenzoyl peroxide, reactions  
 105-64-6, Di-isopropyl peroxydicarbonate  
 105-74-8, Dilauroyl peroxide 107-71-1,  
 tert-Butyl peroxy acetate 109-13-7, tert-Butyl  
 peroxy isobutyrate 110-22-5, Diacetyl peroxide  
 614-45-9, tert-Butyl peroxy benzoate 686-31-7, tert-  
 Amylperoxy 2-ethyl hexanoate 927-07-1, tert-Butyl  
 peroxy pivalate 2372-21-6, tert-Butyl peroxy  
 isopropyl carbonate 3006-82-4, tert-Butylperoxy  
 -2-ethyl hexanoate 3851-87-4, Bis(3,5,5-trimethylhexanoyl)  
 peroxide 13122-18-4 15518-51-1, Diethylene glycol  
 bis(tert-butyl peroxydicarbonate) 15520-11-3,  
 Bis(4-tert-butylcyclohexyl) peroxydicarbonate  
 16111-62-9, Di-2-ethylhexyl peroxy dicarbonate  
 26748-38-9, tert-Butyl peroxy neoheptanoate 29240-17-3,  
 tert-Amyl peroxy pivalate 34443-12-4, tert-Butyl  
 peroxy-2-ethylhexyl carbonate 36536-42-2 51938-28-4,  
 tert-Hexyl peroxy pivalate 52238-68-3 68860-54-8  
 919110-90-0  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (electrolyte for lithium secondary  
 battery)

IT 71-43-2, Benzene, uses 78-67-1, 2,2'-Azo  
 -bis(isobutyronitrile) 96-49-1, Ethylene carbonate 105-58-8,  
 Diethyl carbonate 108-32-7, Propylene carbonate 108-67-8,  
 Mesitylene, uses 108-86-1, Bromobenzene, uses 108-88-3, Toluene,  
 uses 108-90-7, Chlorobenzene, uses 462-06-6, Fluorobenzene  
 463-79-6D, Carbonic acid, ester 616-38-6, Dimethyl carbonate  
 623-53-0, EthylMethyl carbonate 623-96-1, Dipropyl carbonate  
 1330-20-7, Xylene, uses 2094-98-6 4419-11-8, 2,2'-  
 Azo-bis(2,4-dimethyl valeronitrile) 4437-70-1,  
 2,3-Butylene carbonate 4437-85-8, 1,2-Butylene carbonate  
 4437-86-9 7447-41-8, Lithium chloride, uses 7791-03-9, Lithium  
 perchlorate 10377-51-2, Lithium iodide 14024-11-4, Lithium  
 tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate  
 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium  
 hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate  
 33454-82-9, Lithium triflate 35363-40-7, Ethylpropyl carbonate  
 37220-89-6, Aluminum lithium oxide 56525-42-9, Methylpropyl  
 carbonate 89489-56-5, 1,2-Pentylene carbonate 90076-65-6  
 114435-02-8, Fluoroethylene carbonate 131651-65-5  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (electrolyte for lithium secondary  
 battery)

L53 ANSWER 2 OF 3 HCAPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2004:203431 HCAPLUS Full-text  
 DOCUMENT NUMBER: 140:238483  
 TITLE: **Electrolyte for a lithium battery**  
 INVENTOR(S): Park, Yong-Chul; Jung, Won-Ii; Kim, Geun-Bae;  
 Cho, Jae-Phil; Jung, Cheol-Soo  
 PATENT ASSIGNEE(S): S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 13 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004048163	A1	20040311	US 2003-656086	200309 05
KR 2004022054	A	20040311	KR 2002-53879	200209 06
JP 2004103573	A	20040402	JP 2003-282119	200307 29
CN 1495961	A	20040512	CN 2003-164853	200309 06
PRIORITY APPLN. INFO.:			KR 2002-53879	A 200209 06

OTHER SOURCE(S): MARPAT 140:238483

AB An **electrolyte for a lithium battery** includes a nonaq. organic solvent, a lithium salt, and an additive comprising (a) a sulfone-based compound and (b) a C3-30 organic **peroxide** or **azo**-based compound. The **electrolyte** may further include a poly(ester)(meth)acrylate or a polymer that is derived from a (polyester)polyol with at least three hydroxyl (-OH) groups, where a portion or all of the hydroxyl groups are substituted with a (meth)acrylic ester and the remaining hydroxyl groups that are not substituted with the (meth)acrylic ester are substituted with a group having no radical reactivity. The lithium **battery** comprising the **electrolyte** of the present invention has a significantly improved charge-discharge and cycle life characteristics, recovery capacity ratio at high temperature, and swelling inhibition properties.

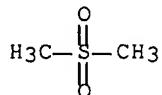
IT 67-71-0, Methyl sulfone 77-77-0, Vinyl sulfone  
 78-67-1, 2,2'-Azobisisobutyronitrile  
 94-36-0, Benzoyl peroxide, uses 105-64-6  
 , Diisopropyl peroxy dicarbonate 105-74-8,  
 Lauroyl peroxide 126-33-0, Tetramethylene  
 sulfone 127-63-9, Phenyl sulfone 620-32-6,  
 Benzyl sulfone 1561-49-5, Dicyclohexylperoxy  
 dicarbonate 1712-87-4, m-Toluoyl peroxide  
 3006-82-4, tert-Butylperoxy-2-ethyl hexanoate  
 14666-78-5 15520-11-3, Bis(4-tert-butylcyclohexyl)  
 peroxy dicarbonate 28452-93-9, Butadiene sulfone  
 32752-09-3, Isobutyl peroxide 92177-99-6

, 3,3,5-Trimethylhexanoyl **peroxide**  
 RL: MOA (Modifier or additive use); USES (Uses)

(electrolyte for lithium battery)

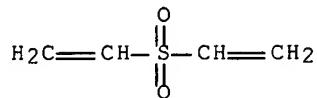
RN 67-71-0 HCAPLUS

CN Methane, 1,1'-sulfonylbis- (CA INDEX NAME)



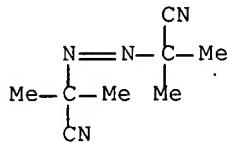
RN 77-77-0 HCAPLUS

CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)



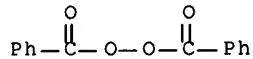
RN 78-67-1 HCAPLUS

CN Propanenitrile, 2,2'-(1,2-diazenediyl)bis[2-methyl- (CA INDEX NAME)



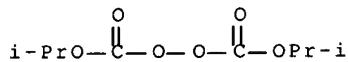
RN 94-36-0 HCAPLUS

CN Peroxide, dibenzoyl (CA INDEX NAME)



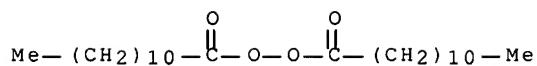
RN 105-64-6 HCAPLUS

CN Peroxydicarbonic acid, C,C'-bis(1-methylethyl) ester (CA INDEX NAME)

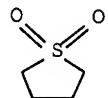


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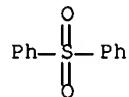
CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



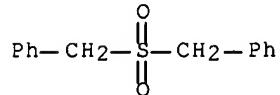
RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



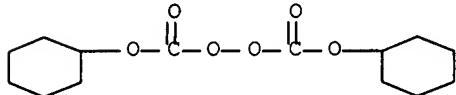
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 CN Benzene, 1,1'-sulfonylbis- (CA INDEX NAME)



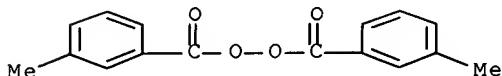
RN 620-32-6 HCAPLUS  
 CN Benzene, 1,1'-(sulfonylbis(methylene))bis- (CA INDEX NAME)



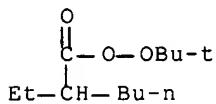
RN 1561-49-5 HCAPLUS  
 CN Peroxydicarbonic acid, C,C'-dicyclohexyl ester (CA INDEX NAME)



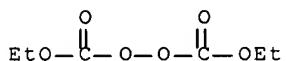
RN 1712-87-4 HCAPLUS  
 CN Peroxide, bis(3-methylbenzoyl) (CA INDEX NAME)



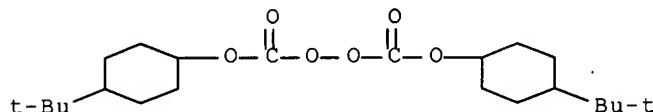
RN 3006-82-4 HCAPLUS  
 CN Hexaneperoxoic acid, 2-ethyl-, 1,1-dimethylethyl ester (CA INDEX NAME)



RN 14666-78-5 HCAPLUS  
 CN Peroxydicarbonic acid, diethyl ester (CA INDEX NAME)



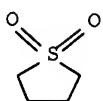
RN 15520-11-3 HCAPLUS  
 CN Peroxydicarbonic acid, C,C'-bis[4-(1,1-dimethylethyl)cyclohexyl] ester (CA INDEX NAME)



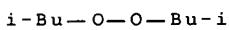
RN 28452-93-9 HCAPLUS  
 CN Thiophene, dihydro-, 1,1-dioxide (CA INDEX NAME)

CM 1

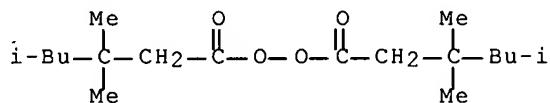
CRN 126-33-0  
 CMF C4 H8 O2 S



RN 32752-09-3 HCAPLUS  
 CN Peroxide, bis(2-methylpropyl) (CA INDEX NAME)



RN 92177-99-6 HCAPLUS  
 CN Peroxide, bis(3,3,5-trimethyl-1-oxohexyl) (9CI) (CA INDEX NAME)



IC ICM .H01M010-40  
 INCL 429326000; 429329000; 429339000; 429340000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 ST lithium battery electrolyte  
 IT Battery electrolytes  
     (electrolyte for lithium battery)  
 IT Aromatic hydrocarbons, uses  
     Carbonates, uses  
     Esters, uses  
     Ethers, uses  
     Ketones, uses  
     RL: DEV (Device component use); USES (Uses)  
     (electrolyte for lithium battery)  
 IT Azo compounds  
     RL: MOA (Modifier or additive use); USES (Uses)  
     (electrolyte for lithium battery)  
 IT Carbonaceous materials (technological products)  
     RL: MOA (Modifier or additive use); USES (Uses)  
     (electrolyte for lithium battery)  
 IT Sulfones  
     RL: MOA (Modifier or additive use); USES (Uses)  
     (electrolyte for lithium battery)  
 IT Polyesters, uses  
     RL: DEV (Device component use); USES (Uses)  
     (hydroxy-terminated; electrolyte for lithium  
     battery)  
 IT Secondary batteries  
     (lithium; electrolyte for lithium  
     battery)  
 IT Polyesters, uses  
     RL: DEV (Device component use); USES (Uses)  
     (methacrylate; electrolyte for lithium  
     battery)  
 IT Peroxides, uses  
     RL: MOA (Modifier or additive use); USES (Uses)  
     (organic, C3-30; electrolyte for lithium  
     battery)  
 IT Esters, uses  
     RL: DEV (Device component use); USES (Uses)  
     (poly-; electrolyte for lithium  
     battery)  
 IT Imides  
     Sulfonic acids, uses  
     RL: DEV (Device component use); USES (Uses)  
     (sulfonimides, perfluoro derivs., lithium salts  
     ; electrolyte for lithium battery)  
 IT 56-81-5, Glycerol, uses 71-43-2, Benzene, uses 96-49-1, Ethylene  
     carbonate 98-95-3, Nitrobenzene, uses 105-58-8, Diethyl  
     carbonate 108-32-7, Propylene carbonate 108-88-3, Toluene, uses  
     108-90-7, Chlorobenzene, uses 149-32-6, Erythritol 462-06-6,

Fluorobenzene 616-38-6, Dimethyl carbonate 623-53-0, Methylethyl carbonate 623-96-1, Dipropyl carbonate 1330-20-7, Xylene, uses 4437-85-8, Butylene carbonate 7790-99-0, Iodine chloride (ICl) 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide (LiI) 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 27359-10-0, Trifluorotoluene 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate, uses 39300-70-4, Lithium nickel oxide 56525-42-9, Methyl propyl carbonate, uses 90076-65-6 131651-65-5, Lithium nonafluorobutanesulfonate 162684-16-4, Lithium manganese nickel oxide 193215-00-8, Cobalt lithiummanganese nickel oxide Co0.1LiMn0.2Ni0.7O2

RL: DEV (Device component use); USES (Uses)  
(electrolyte for lithium battery)

IT 67-71-0, Methyl sulfone 77-77-0, Vinyl sulfone 78-67-1, 2,2'-Azobisisobutyronitrile 94-36-0, Benzoyl peroxide, uses 105-64-6, Diisopropyl peroxy dicarbonate 105-74-8, Lauroyl peroxide 126-33-0, Tetramethylene sulfone 127-63-9, Phenyl sulfone 620-32-6, Benzyl sulfone 1561-49-5, Dicyclohexylperoxy dicarbonate 1712-87-4, m-Toluoyl peroxide 3006-82-4, tert-Butylperoxy-2-ethyl hexanoate 14666-78-5 15520-11-3, Bis(4-tert-butylcyclohexyl) peroxy dicarbonate 26748-41-4 28452-93-9, Butadiene sulfone 32752-09-3, Isobutyl peroxide 92177-99-6, 3,3,5-Trimethylhexanoyl peroxide

RL: MOA (Modifier or additive use); USES (Uses)  
(electrolyte for lithium battery)

IT 79-10-7DP, Acrylic acid, reaction product with dipentaerythritol and ε-caprolactone and butylcarbonic acid 126-58-9DP, Dipentaerythritol, reaction product with ε-caprolactone and acrylic acid and butylcarbonic acid 502-44-3DP, ε-Caprolactone, reaction product with dipentaerythritol and acrylic acid and butylcarbonic acid 10411-26-4DP, MonoButylcarbonate, reaction product with dipentaerythritol and ε-caprolactone and acrylic acid

RL: MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(electrolyte for lithium battery)

L53 ANSWER 3 OF 3 HCPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 1996:754386 HCPLUS Full-text  
DOCUMENT NUMBER: 126:92052  
TITLE: Catalyst-containing solid **electrolytes**  
and batteries using these **electrolytes**  
INVENTOR(S): Chaloner-Gill, Benjamin; Olsen, Ib I.; Saidi, Eileen S.  
PATENT ASSIGNEE(S): USA  
SOURCE: U.S., 8 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 5580680

A

19961203

US 1994-267066

199406

27

PRIORITY APPLN. INFO.:

US 1994-267066

199406

27

AB The **electrolytes** include a 1st catalyst that is capable of initiating the polymerization of solvent components at elevated temps. to increase the resistance (or impedance) of the solid **electrolyte** and thereby prevent thermal runaway and/or a 2nd catalyst that is capable of initiating the polymerization of flammable substances (e.g., olefins) in the solvent. To assure that the catalysts do not prematurely initiate polymerization below a certain temperature, the catalysts may be microencapsulated within a heat-sensitive material that disintegrates or dissolve at a predetd. elevated temperature to release the catalysts. Microencapsulation permits the controlled release of the catalysts into the **electrolyte** under the appropriate conditions.

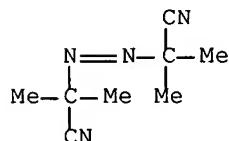
IT 78-67-1, Azobisisobutyronitrile 94-36-0,

Benzoyl peroxide, uses

RL: CAT (Catalyst use); USES (Uses)  
(polymerization catalyst for battery solid **electrolytes**)

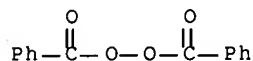
RN 78-67-1 HCAPLUS

CN Propanenitrile, 2,2'-(1,2-diazenediyl)bis[2-methyl- (CA INDEX NAME)



RN 94-36-0 HCAPLUS

CN Peroxide, dibenzoyl (CA INDEX NAME)

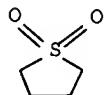


IT 126-33-0, Sulfolane

RL: MOA (Modifier or additive use); USES (Uses)  
(polymerization catalyst for battery solid **electrolytes** containing solvent of)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M006-16

INCL 429192000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 37  
 ST battery solid **electrolyte** solvent polymn catalyst;  
 flammable substance polymn catalyst battery **electrolyte**;  
 safety battery polymn catalyst **electrolyte**  
 IT Polymerization catalysts  
 (Ziegler-Natta; for battery solid **electrolytes**)  
 IT Polymerization catalysts  
 (battery solid **electrolytes** containing)  
 IT Battery **electrolytes**  
 (containing polymerization catalyst)  
 IT Secondary **batteries**  
 (lithium; with polymerization catalysts for safety)  
 IT Safety  
 (of lithium **batteries** with polymerization  
 catalysts-containing solid **electrolytes**)  
 IT Bronsted acids  
 RL: CAT (Catalyst use); USES (Uses)  
 (polymerization catalyst for battery solid **electrolytes**)  
 IT 78-67-1, **Azobisisobutyronitrile** 94-36-0,  
 Benzoyl peroxide, uses 110-22-5, Acetyl peroxide  
 7440-23-5, Sodium, uses 7637-07-2, Boron trifluoride, uses  
 RL: CAT (Catalyst use); USES (Uses)  
 (polymerization catalyst for battery solid **electrolytes**)  
 IT 67-68-5, uses 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene  
 carbonate 108-32-7, Propylene carbonate 110-71-4, Glyme  
 111-96-6, Diglyme 112-49-2, Triglyme 126-33-0, Sulfolane  
 143-24-8, Tetruglyme 646-06-0, Dioxolane  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (polymerization catalyst for battery solid **electrolytes** containing  
 solvent of)

=> d 154 ibib abs hitstr hitind 1-12

L54 ANSWER 1 OF 12 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2007:1278662 HCPLUS Full-text  
 TITLE: Anion receptor comprising aromatic amines  
 substituted with electron withdrawing groups and  
**electrolyte** using the same for alkali  
 metal batteries  
 INVENTOR(S): Kim, Hee Jung; Lee, Won Sil  
 PATENT ASSIGNEE(S): Kyungwon Enterprise Co., Ltd., S. Korea  
 SOURCE: PCT Int. Appl., 63pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2007126262	A1	20071108	WO 2007-KR2080	200704 27

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,  
 CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES,  
 FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP,

KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY,  
 MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM,  
 PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV,  
 SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM,  
 ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,  
 IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK,  
 TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,  
 TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,  
 ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.:

KR 2006-38047

A

200604

27

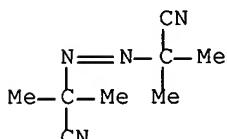
AB Disclosed is a novel anion receptor and **electrolytes** containing the same. A novel anion receptor is an aromatic hydrocarbon compound having an amine substituted with electron withdrawing groups. When the anion receptor is added to the **electrolyte**, ionic conductivity and cation transference number of **electrolytes** are enhanced, thereby increasing the electrochem. stability of alkali metal batteries using the **electrolytes**. Thus, sulfonylation of 4-hexylaniline with triflic anhydride afforded the anionic receptor 4-[H(CH<sub>2</sub>)<sub>6</sub>C<sub>6</sub>H<sub>4</sub>N(SO<sub>2</sub>CF<sub>3</sub>)<sub>2</sub>] (4-hexylphenyl-TFSI); the latter was mixed with 0.8 g bisphenol A ethoxylate dimethacrylate (crosslinking agent) and lithium triflate and to this mixture was subsequently added dimethoxyphenylacetophenone and the resulting solution coated onto a conductive glass substrate and exposed to UV irradiation, forming the solid polymer **electrolyte**. The ionic conductivity of the solid polymer **electrolyte** containing 4-hexylphenyl-TFSI as anion receptor exceeded the comparative **electrolyte** without anion receptor as temperature increased.

IT 78-67-1, AIBN

RL: CAT (Catalyst use); USES (Uses)  
 (heat-curing initiator for polymer **electrolyte**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

RN 78-67-1 HCAPLUS

CN Propanenitrile, 2,2'-(1,2-diazenediyl)bis[2-methyl- (CA INDEX NAME)

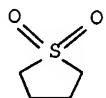


IT 126-33-0, Sulfolane

RL: TEM (Technical or engineered material use); USES (Uses)  
 (nonaq. solvent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST alkali metal battery anion receptor arom amine **electrolyte**  
 IT Anions  
   Battery **electrolytes**  
   Ionic conductivity  
   Polymer **electrolytes**  
     (anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)  
 IT Amines  
   RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
     (aromatic, substituted with electron withdrawing groups, as anion receptors; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)  
 IT Carbon black  
   RL: TEM (Technical or engineered material use); USES (Uses)  
     (cathode coating; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)  
 IT Fluoropolymers  
   RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)  
     (cathode coatings; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)  
 IT Secondary batteries  
     (lithium; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)  
 IT Polyoxyalkylenes  
   RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)  
     (polymer **electrolytes**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)  
 IT Receptors  
   RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
     (synthetic; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)  
 IT lithium alloy, base, base  
   RL: TEM (Technical or engineered material use); USES (Uses)  
     (anode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)  
 IT 7447-41-8, Lithium chloride 7550-35-8, Lithium bromide 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 87187-79-9 90076-65-6, Lithium

bis(trifluoromethanesulfonyl)imide 132404-42-3  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (anion receptor comprising aromatic amines substituted with electron  
 withdrawing groups and **electrolyte** using the same for  
 alkali metal batteries)

IT 955997-47-4P  
 RL: MOA (Modifier or additive use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (anion receptor comprising aromatic amines substituted with electron  
 withdrawing groups and **electrolyte** using the same for  
 alkali metal batteries)

IT 64696-13-5DP, Bisphenol A ethoxylate dimethacrylate homopolymer,  
 lithium complexes, trifluoromethanesulfonimide-containing  
 RL: POF (Polymer in formulation); SPN (Synthetic preparation); TEM  
 (Technical or engineered material use); PREP (Preparation); USES  
 (Uses)  
 (anion receptor comprising aromatic amines substituted with electron  
 withdrawing groups and **electrolyte** using the same for  
 alkali metal batteries)

IT 7439-93-2DP, Lithium, polymer **electrolyte** complexes  
 RL: SPN (Synthetic preparation); TEM (Technical or engineered  
 material use); PREP (Preparation); USES (Uses)  
 (anion receptor comprising aromatic amines substituted with electron  
 withdrawing groups and **electrolyte** using the same for  
 alkali metal batteries)

IT 2428-04-8P 838884-10-9P 955997-42-9P 955997-43-0P  
 955997-44-1P 955997-45-2P 955997-46-3P 955997-48-5P  
 955997-49-6P 955997-50-9P 955997-51-0P 955997-52-1P  
 955997-53-2P 955997-54-3P 955997-55-4P 955997-56-5P  
 955997-57-6P 955997-58-7P 955997-59-8P 955997-60-1P  
 955997-61-2P 955997-62-3P 955997-63-4P 955997-64-5P  
 955997-65-6P 955997-66-7P 955997-67-8P 955997-68-9P  
 955997-69-0P 955997-70-3P 955997-71-4P 955997-72-5P  
 955997-73-6P 955997-74-7P 955997-75-8P 955997-76-9P  
 955997-78-1P 955997-79-2P 955997-80-5P 955997-81-6P  
 955997-82-7P 955997-83-8P 955997-84-9P 955997-85-0P  
 955997-86-1P  
 RL: MOA (Modifier or additive use); SPN (Synthetic preparation);  
 PREP (Preparation); USES (Uses)  
 (anion receptor; anion receptor comprising aromatic amines  
 substituted with electron withdrawing groups and  
**electrolyte** using the same for alkali metal batteries)

IT 7439-93-2, Lithium 7439-93-2D, Lithium, intercalation compds. with  
 carbon 7440-44-0D, Carbon, intercalation compds. with lithium  
 7782-42-5, Graphite 7782-42-5D, Graphite, intercalation compds.  
 with lithium  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (anode; anion receptor comprising aromatic amines substituted with  
 electron withdrawing groups and **electrolyte** using the  
 same for alkali metal batteries)

IT 145106-51-0P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);  
 RACT (Reactant or reagent)  
 (azidification; anion receptor comprising aromatic amines  
 substituted with electron withdrawing groups and  
**electrolyte** using the same for alkali metal batteries)

IT 24937-79-9, Poly(vinylidene fluoride)  
 RL: POF (Polymer in formulation); TEM (Technical or engineered  
 material use); USES (Uses)  
 (cathode coating; anion receptor comprising aromatic amines

substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 25233-30-1, Polyaniline 25948-29-2, Poly(carbon disulfide)  
 RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)  
 (cathode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 12031-65-1, Lithium nickel oxide (LiNiO<sub>2</sub>) 12057-17-9, Lithium manganese oxide (LiMnO<sub>4</sub>) 12162-79-7, lithium manganese oxide (LiMnO<sub>2</sub>) 12190-79-3, cobalt lithium oxide (LiCoO<sub>2</sub>) 12201-18-2, Lithium molybdenum sulfide (LiMoS<sub>2</sub>) 55326-82-4, lithium titanium sulfide (LiTiS<sub>2</sub>) 135573-53-4, Cobalt lithium nickel oxide (Co<sub>0.1</sub>LiNiO<sub>2</sub>) 138187-48-1, Lithium vanadium oxide (Li<sub>1.2</sub>V<sub>2</sub>O<sub>5</sub>) 252234-58-5 252234-59-6 256345-13-8, Lithium vanadium oxide (Li<sub>2.5</sub>V<sub>6</sub>O<sub>13</sub>) 600177-48-8 911110-65-1, Lithium niobium selenide (LiNbSe<sub>3</sub>)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (cathode; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 128-09-6, N-Chlorosuccinimide  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (chlorination agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 506-77-4, Cyanogen chloride  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (cyanation agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 367-25-9, 2,4-Difluoroaniline  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (cyanation, chlorination, trifluoroacetylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 5339-26-4P, 1-(2-Bromoethyl)-4-nitrobenzene  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (dehydrobromination; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 78-67-1, AIBN  
 RL: CAT (Catalyst use); USES (Uses)  
 (heat-curing initiator for polymer **electrolyte**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 10036-47-2, Tetrafluorohydrazine  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (hydrazinolysis reaction; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 328-73-4, 1-Iodo-3,5-bis(trifluoromethyl)benzene 2265-93-2, 2,4-Difluoroiodobenzene  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (hydrazinolysis; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 9011-17-0, Vinylidene fluoride-hexafluoropropylene copolymer  
 25014-41-9, Poly(acrylonitrile)  
 RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)  
 (matrix; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 1072-71-5, 2,5-Dimercapto-1,3,4-thiadiazole  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (mixture with polyaniline; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 103-63-9, Phenethyl bromide  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (nitration; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 75-05-8, Acetonitrile 96-47-9, 2-Methyltetrahydrofuran 96-48-0,  
 $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8,  
 Diethyl carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 109-87-5, Dimethoxymethane 109-99-9, THF 110-71-4,  
 1,2-Dimethoxyethane 126-33-0, Sulfolane 616-38-6,  
 Dimethyl carbonate 646-06-0, 1,3-Dioxolane 872-50-4,  
 N-Methyl-2-pyrrolidinone 1072-47-5, 4-Methyl-1,3-dioxolane 19836-78-3, 3-Methyl-2-oxazolidinone 51667-26-6, Oxazolidinone  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (nonaq. solvent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 84-65-1, Anthraquinone 90-94-8, Michler's ketone 93-97-0,  
 Benzoyl benzoate 119-61-9, Benzophenone 120-51-4, Benzyl benzoate 134-85-0, p-Chlorobenzophenone 492-22-8, Thioxanthone 574-09-4, Ethyl benzoin ether 927-07-1, tert-Butyl **peroxypivalate** 947-19-3, 1-Hydroxycyclohexyl phenyl ketone 2648-61-5,  $\alpha,\alpha$ -Dichloroacetophenone 6175-45-7,  
 $\alpha,\alpha$ -Diethoxyacetophenone 6652-28-4, Isopropyl benzoin ether 6652-29-5, Benzoin phenyl ether 7473-98-5,  
 2-Hydroxy-2-methyl-1-phenyl-1-propanone 24650-42-8, DMPA 27962-49-8 72896-34-5, Chlorothioxanthone 75081-21-9,  
 (Isopropyl)thioxanthone  
 RL: CAT (Catalyst use); USES (Uses)  
 (photocuring initiator for polymer **electrolyte**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 9003-11-6D, Ethylene glycol propylene glycol copolymer, di-Bu ether-terminated 24991-55-7, Polyethylene glycol dimethyl ether 24991-61-5, Polypropylene glycol dimethyl ether 26142-30-3,  
 Polypropylene glycol diglycidyl ether 26403-72-5, Polyethylene glycol diglycidyl ether 31885-97-9, Polyethylene glycol dibutyl ether 53609-62-4, Polyethylene glycol diethyl ether 60314-50-3,  
 Polyethylene glycol dipropyl ether 106392-12-5D, Block polyethylene-polypropylene glycol, di-Bu ether-terminated  
 RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)  
 (polymer **electrolyte**; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 99-35-4, 1,3,5-Trinitrobenzene

RL: RCT (Reactant); RACT (Reactant or reagent)  
(reduction; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 100-13-0P, 4-Nitrostyrene 13556-15-5P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(reduction; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 9003-07-0, Polypropylene  
RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)  
(separator; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 124-63-0, Methanesulfonyl chloride 358-23-6, Triflic anhydride  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(sulfonylation agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 96-50-4, 2-Aminothiazole 109-12-6, 2-Aminopyrimidine 141-86-6,  
2,6-Diaminopyridine 328-74-5, 3,5-Bis(trifluoromethyl)aniline  
670-96-2, 2-Phenylimidazole 7673-09-8 31230-17-8,  
3-Amino-5-methylpyrazole 33228-45-4, 4-Hexylaniline  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(sulfonylation, cyanation, chlorination, trifluoroacetylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 108-72-5P, 1,3,5-Triaminobenzene 1520-21-4P, 4-Aminostyrene  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(sulfonylation, cyanation, chlorination, trifluoroacetylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 108-73-6, 1,3,5-Benzenetriol  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(sulfonylation; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

IT 68602-57-3  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(trifluoroacetylation agent; anion receptor comprising aromatic amines substituted with electron withdrawing groups and **electrolyte** using the same for alkali metal batteries)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 2 OF 12 HCPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 2007:197873 HCPLUS Full-text  
DOCUMENT NUMBER: 146:255355  
TITLE: Mesoporous carbon composite, method of preparing the same, and fuel cell using the mesoporous carbon composite  
INVENTOR(S): Pak, Chan-Ho; Choi, Yeong-Suk; Chang, Hyuk; Joo, Sang-Hoon  
PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea

SOURCE: U.S. Pat. Appl. Publ., 16pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2007042268	A1	20070222	US 2006-443165	200605 31
KR 2007021846	A	20070223	KR 2005-76542	200508 20
CN 1917258	A	20070221	CN 2006-10087647	200605 31
JP 2007055882	A	20070308	JP 2006-152551	200605 31
PRIORITY APPLN. INFO.:			KR 2005-76542	A 200508 20

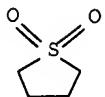
AB A mesoporous carbon composite includes mesoporous carbon having mesopores; a conductive polymer coated on only an outer surface of the mesoporous carbon; and an organic **electrolyte** comprising a lithium salt and an organic solvent. The mesoporous carbon composite may be prepared by impregnating an ordered mesoporous silica (OMS) with a carbon precursor mixture comprising a carbon precursor, an acid, and a solvent; heat-treating and carbonizing the impregnated OMS to form an OMS-carbon composite; mixing the OMS-carbon composite with a monomer that forms a conductive polymer and a solvent to provide a surface of the OMS-carbon composite with the monomer that forms a conductive polymer; polymerizing the monomer to obtain a conductive polymer-coated OMS-carbon composite; removing the OMS from the conductive polymer-coated OMS-carbon composite to obtain a conductive polymer-coated mesoporous carbon; and doping the conductive polymer-coated mesoporous carbon with an organic **electrolyte** comprising a lithium salt and an organic solvent to form the mesoporous carbon composite. A supported catalyst contains the mesoporous carbon composite, and a fuel cell uses an electrode containing the mesoporous carbon composite.

IT 126-33-0, Sulfolane

RL: NUU (Other use, unclassified); USES (Uses)  
(solvent; mesoporous carbon composite, method of preparing the same,  
and fuel cell using the mesoporous carbon composite)

RN 126-33-0 HCPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



INCL 429213000; 429232000; 252182100; 502159000; 502180000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 7722-84-1, Hydrogen **peroxide**, reactions

RL: RGT (Reagent); RACT (Reactant or reagent)  
 (polymerization initiator; mesoporous carbon composite, method of preparing  
 the same, and fuel cell using the mesoporous carbon composite)  
 IT 110-71-4 126-33-0, Sulfolane 73506-93-1, Diethoxyethane  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (solvent; mesoporous carbon composite, method of preparing the same,  
 and fuel cell using the mesoporous carbon composite)

L54 ANSWER 3 OF 12 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2005:735154 HCPLUS Full-text  
 DOCUMENT NUMBER: 143:196855  
 TITLE: Protected active metal electrode and battery  
 cell structures with nonaqueous interlayer  
 architecture  
 INVENTOR(S): Visco, Steven J.; Katz, Bruce D.; Nimon,  
 Yevgeniy S.; De Jonghe, Lutgard C.  
 PATENT ASSIGNEE(S): Polyplus Battery Company, USA  
 SOURCE: U.S. Pat. Appl. Publ., 20 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005175894	A1	20050811	US 2004-824944	200404 14
US 7282295	B2	20071016		
AU 2004316638	A1	20050909	AU 2004-316638	200410 08
CA 2555637	A1	20050909	CA 2004-2555637	200410 08
WO 2005083829	A2	20050909	WO 2004-US33371	200410 08
WO 2005083829	A3	20060504		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
EP 1714349	A2	20061025	EP 2004-794655	200410 08
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR				
CN 1938895	A	20070328	CN 2004-80042697	

BR 2004018500	A	20070515	BR 2004-18500	200410 08
JP 2007524204	T	20070823	JP 2006-552102	200410 08
MX 2006PA09007	A	20061020	MX 2006-PA9007	200608 07
KR 2007004670	A	20070109	KR 2006-717692	200608 31
PRIORITY APPLN. INFO.:			US 2004-542532P	P 200402 06
			US 2004-548231P	P 200402 27
			US 2004-824944	A 200404 14
			WO 2004-US33371	W 200410 08

AB The invention concerns active metal and active metal intercalation electrode structures and battery cells having ionically conductive protective architecture including an active metal (e.g., lithium) conductive impervious layer separated from the electrode (anode) by a porous separator impregnated with a non-aqueous electrolyte (anolyte). This protective architecture prevents the active metal from deleterious reaction with the environment on the other (cathode) side of the impervious layer, which may include aqueous or nonaq. liquid electrolytes (catholytes) and/or a variety electrochem. active materials, including liquid, solid and gaseous oxidizers. Safety additives and designs that facilitate manufacture are also provided.

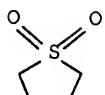
IT 126-33-0, Sulfolane

RL: DEV (Device component use)

(protected active metal electrode and battery cell structures with nonaq. interlayer architecture)

RN 126-33-0 HCPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M004-60

INCL 429212000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 72

IT Primary batteries

Secondary batteries

(lithium; protected active metal electrode and battery cell structures with nonaq. interlayer architecture)

IT    Battery anodes  
 Battery electrolytes  
 Ceramics  
 Gelation agents  
 Glass ceramics  
 Ionic liquids  
 Oxidizing agents  
 Polymerization catalysts  
 Primary batteries  
 Primary battery separators  
 Seawater  
 Secondary batteries  
 (protected active metal electrode and battery cell structures with nonaq. interlayer architecture)

IT    7446-09-5, Sulfur dioxide, processes 7632-00-0, Sodium nitrite 7722-84-1, Hydrogen peroxide, processes 7757-83-7, Sodium sulfite 7758-09-0, Potassium nitrite 7782-44-7, Oxygen, processes 10102-44-0, Nitrogen dioxide, processes 10117-38-1, Potassium sulfite 14915-07-2, Peroxide  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
 (protected active metal electrode and battery cell structures with nonaq. interlayer architecture)

IT    64-19-7, Acetic acid, uses 71-47-6, Formate, uses 79-20-9, Methyl acetate 96-47-9, 2-Methyltetrahydrofuran 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 107-31-3, Methyl formate 108-32-7, Propylene carbonate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane 546-89-4, Lithium acetate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 646-06-0, 1,3-Dioxolane 1301-96-8, Silver oxide (AgO) 1310-65-2, Lithium hydroxide 1332-37-2, Iron oxide, uses 1335-25-7, Lead oxide 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 7439-95-4, Magnesium, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses 7440-36-0, Antimony, uses 7440-43-9, Cadmium, uses 7440-44-0, Carbon, uses 7440-55-3, Gallium, uses 7440-66-6, Zinc, uses 7440-69-9, Bismuth, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7647-01-0, Hydrochloric acid, uses 7664-38-2; Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses 7719-09-7, Thionyl chloride 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 11129-60-5, Manganese oxide 12026-04-9, Nickel hydroxide oxide Niooh 12124-97-9, Ammonium bromide 12125-02-9, Ammonium chloride, uses 14283-07-9, Lithium tetrafluoroborate 16749-13-6D, Phosphonium, compound 16969-45-2D, Pyridinium, derivs. 17009-90-4D, Imidazolium, derivs. 21324-40-3, Lithium hexafluorophosphate 25067-64-5 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 74432-42-1, Lithium polysulfide 90076-65-6 132843-44-8 155371-19-0, 1-Ethyl-3-methylimidazolium hexafluorophosphate 174501-64-5, 1-Butyl-3-methylimidazolium hexafluorophosphate 244193-50-8, 1-Hexyl-3-methylimidazolium tetrafluoroborate 328090-25-1, 1-Ethyl-3-methylimidazolium tosylate  
 RL: DEV (Device component use)  
 (protected active metal electrode and battery cell structures with nonaq. interlayer architecture)

ACCESSION NUMBER: 2005:155490 HCAPLUS Full-text  
 DOCUMENT NUMBER: 142:264348  
 TITLE: **Electrolyte for rechargeable lithium battery**  
 INVENTOR(S): Lee, Yong-Beom; Song, Eui-Hwan; Kim, Kwang-Sup;  
 Earmme, Tae-Shik; Kim, You-Mee  
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
 SOURCE: Eur. Pat. Appl., 32 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1508934	A1	20050223	EP 2004-90320	200408 19
EP 1508934	B1	20070228	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR	
KR 2005020067	A	20050304	KR 2003-57716	200308 20
KR 2005078443	A	20050805	KR 2004-5874	200401 29
AT 355629	T	20060315	AT 2004-90320	200408 19
JP 2005072003	A	20050317	JP 2004-241017	200408 20
US 2005084765	A1	20050421	US 2004-924248	200408 20
CN 1612405	A	20050504	CN 2004-10098111	200408 20
PRIORITY APPLN. INFO.:			KR 2003-57716	A 200308 20
			KR 2004-5874	A 200401 29

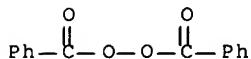
OTHER SOURCE(S): MARPAT 142:264348  
 AB Disclosed is an **electrolyte** for a rechargeable **lithium battery**, including a mixture of organic solvents including a cyclic solvent and a nitrile-based solvent represented by the formula R-C.tplbond.N (R is from C1-10 aliphatic hydrocarbons, C1-10 halogenated aliphatic hydrocarbons, C6-10 aromatic hydrocarbons, and C6-10 halogenated aromatic hydrocarbons) and a **lithium salt**.  
 IT 94-36-0, Dibenzoyl **peroxide**, processes  
 105-74-8, Dilauroyl **peroxide** 3006-82-4,  
 tert-Butyl **peroxy-2-ethyl hexanoate** 4419-11-8,  
 2,2'-**Azobis**(2,4-dimethylvaleronitrile) 15520-11-3

## , Di(4-tert-butylcyclohexyl)peroxydicarbonate

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
 (electrolyte for rechargeable lithium battery)

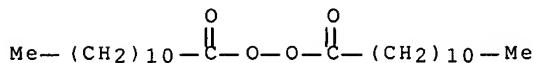
RN 94-36-0 HCAPLUS

CN Peroxide, dibenzoyl (CA INDEX NAME)



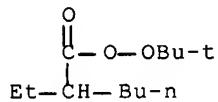
RN 105-74-8 HCAPLUS

CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



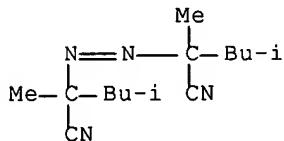
RN 3006-82-4 HCAPLUS

CN Hexaneperoxoic acid, 2-ethyl-, 1,1-dimethylethyl ester (CA INDEX NAME)



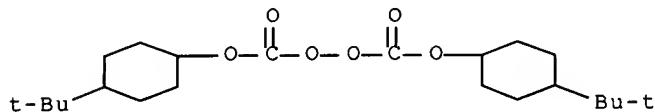
RN 4419-11-8 HCAPLUS

CN Pentanenitrile, 2,2'-(1,2-diazenediyl)bis[2,4-dimethyl- (CA INDEX NAME)

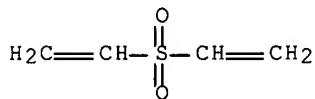


RN 15520-11-3 HCAPLUS

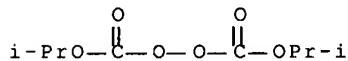
CN Peroxydicarbonic acid, C,C'-bis[4-(1,1-dimethylethyl)cyclohexyl] ester (CA INDEX NAME)



IT 77-77-0, DiVinyl sulfone 105-64-6, Di-  
 isopropylperoxydicarbonate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte for rechargeable lithium  
 battery)  
 RN 77-77-0 HCAPLUS  
 CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)



RN 105-64-6 HCAPLUS  
 CN Peroxydicarbonic acid, C,C'-bis(1-methylethyl) ester (CA INDEX  
 NAME)



IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 ST electrolyte rechargeable lithium battery  
 IT Nitriles, uses  
 RL: DEV (Device component use); USES (Uses)  
 (aliphatic, C1-10; electrolyte for rechargeable  
 lithium battery)  
 IT Nitriles, uses  
 RL: DEV (Device component use); USES (Uses)  
 (aromatic, C6-10; electrolyte for rechargeable  
 lithium battery)  
 IT Battery electrolytes  
 (electrolyte for rechargeable lithium  
 battery)  
 IT Lactones  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte for rechargeable lithium  
 battery)  
 IT Secondary batteries  
 (lithium; electrolyte for rechargeable  
 lithium battery)  
 IT Peroxides, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (organic; electrolyte for rechargeable lithium  
 battery)  
 IT 94-36-0, Dibenzoyl peroxide, processes  
 105-74-8, Dilauroyl peroxide 107-71-1, tert-  
 Butylperoxy acetate 109-13-7, tert-  
 Butylperoxyisobutyrate 110-22-5, Diacetyl peroxide  
 614-45-9, tert-Butylperoxy benzoate 686-31-7, tert-  
 Amylperoxy 2-ethylhexanoate 927-07-1, tert-Butyl

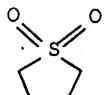
**peroxypivalate** 2372-21-6, **tert-Butyl peroxy**  
**isopropyl carbonate** 3006-82-4, **tert-Butyl peroxy**  
**-2-ethyl hexanoate** 3851-87-4, **Bis(3,5,5-trimethyl)hexanoyl**  
**peroxide** 4419-11-8, **2,2'-Azobis**  
**(2,4-dimethylvaleronitrile)** 13122-18-4, **tert-Butylperoxy**  
**3,5,5-trimethylhexanoate** 15518-51-1, **Diethylene glycol bis(tert-**  
**butylperoxycarbonate)** 15520-11-3,  
**Di(4-tert-butylcyclohexyl)peroxydicarbonate** 25551-14-8  
26748-38-9, **tert-Butyl peroxy** neoheptanoate 26748-41-4,  
**tert-Butyl peroxy** neodecanoate 29240-17-3, **tert-Amyl**  
**peroxypivalate** 34443-12-4, **tert-Butyl peroxy**  
**2-ethylhexyl carbonate** 36536-42-2, **1,6-Hexanediol bis(tert-butyl**  
**peroxycarbonate)** 51240-95-0, **1,1,3,3-Tetramethylbutyl**  
**peroxy** neodecanoate 51938-28-4, **tert-**  
**Hexylperoxypivalate** 52238-68-3, **Bis(3-methoxybutyl)**  
**peroxydicarbonate** 68860-54-8 96989-15-0 845717-44-4  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
process); PROC (Process)  
(electrolyte for rechargeable lithium  
battery)

IT 79-20-9, **Methyl acetate** 96-48-0,  **$\gamma$ -Butyrolactone** 96-49-1,  
**Ethylene carbonate** 105-58-8, **Diethyl carbonate** 106-70-7, **Methyl**  
**hexanoate** 107-12-0, **Propionitrile** 107-31-3, **Methyl formate**  
108-29-2,  **$\gamma$ -Valerolactone** 108-32-7, **Propylene carbonate**  
109-74-0, **Butyronitrile** 110-59-8, **Valeronitrile** 124-12-9,  
**Caprylonitrile** 140-29-4, **Phenylacetonitrile** 141-78-6, **Ethyl**  
**acetate, uses** 326-62-5, **2-FluoroPhenylacetonitrile** 394-47-8,  
**2-Fluorobenzonitrile** 459-22-3, **4-FluoroPhenylacetonitrile**  
502-44-3,  **$\epsilon$ -Caprolactone** 542-28-9,  **$\delta$ -Valerolactone**  
542-52-9, **Dibutyl carbonate** 616-38-6, **Dimethyl carbonate**  
623-53-0, **Ethyl methyl carbonate** 623-96-1, **Dipropyl carbonate**  
629-08-3, **Heptanenitrile** 630-18-2, **tert-Butyl cyanide** 695-06-7,  
 **$\gamma$ -Caprolactone** 766-05-2, **Cyclohexanecarbonitrile**  
1194-02-1, **4-Fluorobenzonitrile** 4254-02-8,  
**Cyclopentanecarbonitrile** 4437-85-8, **Butylene carbonate**  
7439-93-2D, **Lithium, salt** 7791-03-9, **Lithium**  
**perchlorate** 12190-79-3, **Cobalt lithium oxide (CoLiO<sub>2</sub>)**  
14024-11-4, **Lithium tetrachloroaluminate** 14283-07-9, **Lithium**  
**tetrafluoroborate** 18424-17-4, **Lithium hexafluoroantimonate**  
21324-40-3, **Lithium hexafluorophosphate** 29935-35-1, **Lithium**  
**hexafluoroarsenate** 33454-82-9, **Lithium triflate** 57381-51-8,  
**4-Chloro-2-fluoro-benzonitrile** 60702-69-4, **2-Chloro-4-fluoro-**  
**benzonitrile** 90076-65-6 90240-74-7 127813-79-0 132843-44-8  
179802-95-0, **Cobalt lithium manganese nickel oxide**  
(Co0.1LiMn0.1Ni0.8O<sub>2</sub>) 845717-45-5  
RL: DEV (Device component use); USES (Uses)  
(electrolyte for rechargeable lithium  
battery)

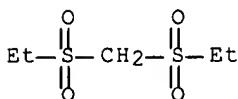
IT 75-05-8, **Acetonitrile, uses** 77-77-0, **DiVinyl sulfone**  
105-64-6, **Di-isopropylperoxydicarbonate**  
628-73-9, **Capronitrile** 872-36-6, **Vinylene carbonate** 3741-38-6,  
**Ethylene sulfite** 16111-62-9, **Bis(2-ethylhexyl)**  
**peroxydicarbonate** 22537-94-6 71331-99-2,  
**Bis(4-tert-butylcyclohexyl)peroxycarbonate** 114435-02-8,  
**Fluoroethylene carbonate**  
RL: MOA (Modifier or additive use); USES (Uses)  
(electrolyte for rechargeable lithium  
battery)

FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

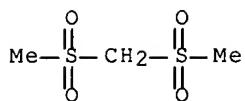
L54 ANSWER 5 OF 12 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2004:1042417 HCPLUS Full-text  
 DOCUMENT NUMBER: 142:300815  
 TITLE: New lithium salts for  
 rechargeable **battery**  
**electrolytes**  
 AUTHOR(S): Mandal, Braja; Sooksimuang, Thanasat; Griffin,  
 Brian; Padhi, Akshaya; Filler, Robert  
 CORPORATE SOURCE: Department of Biological, Chemical and Physical  
 Sciences, Illinois Institute of Technology,  
 Chicago, IL, 60616, USA  
 SOURCE: Solid State Ionics (2004), 175(1-4), 267-272  
 CODEN: SSIOD3; ISSN: 0167-2738  
 PUBLISHER: Elsevier B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The facile syntheses of new, low-cost, non-fluorinated, sulfonyl-substituted  
 imide and methide lithium salts are described. These salts, prepared for  
 potential application in lithium ion rechargeable **battery electrolytes**,  
 exhibit very good electrochem. and thermal behavior. While the salts are very  
 soluble in DMSO and sulfolane, their solubilities in standard carbonate  
 solvents is less than adequate for battery operations. Mol. modifications to  
 improve solubility are in progress.  
 IT 126-33-0, Sulfolane  
 RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)  
 (new lithium salts for rechargeable  
 battery electrolytes)  
 RN 126-33-0 HCPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



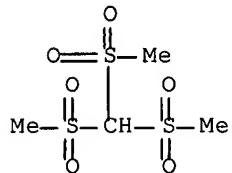
IT 1070-92-4P 1750-62-5P 4610-99-5P  
 90325-14-7P  
 RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation);  
 PREP (Preparation); RACT (Reactant or reagent)  
 (new lithium salts for rechargeable  
 battery electrolytes)  
 RN 1070-92-4 HCPLUS  
 CN Ethane, 1,1'-(methylenebis(sulfonyl)]bis- (CA INDEX NAME)



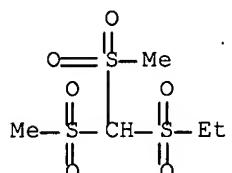
RN 1750-62-5 HCPLUS  
 CN Methane, bis(methylsulfonyl)- (CA INDEX NAME)



RN 4610-99-5 HCAPLUS  
 CN Methane, tris(methylsulfonyl)- (7CI, 8CI, 9CI) (CA INDEX NAME)

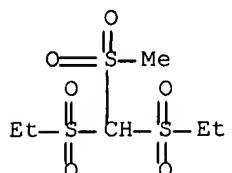


RN 90325-14-7 HCAPLUS  
 CN Ethane, [(bis(methylsulfonyl)methyl)sulfonyl]- (9CI) (CA INDEX NAME)



IT 59099-56-8P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (new lithium salts for rechargeable  
 battery electrolytes)

RN 59099-56-8 HCAPLUS  
 CN Ethane, 1,1'-[[(methylsulfonyl)methylene]bis(sulfonyl)]bis- (9CI)  
 (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 76  
 ST synthesis lithium salt imide methide secondary

IT battery electrolyte cond  
 Stability  
 (hydrolytic, thermal, electrochem., of lithium imide salts; new lithium salts for rechargeable battery electrolytes)

IT Secondary batteries  
 (lithium; new lithium salts for rechargeable battery electrolytes)

IT Alkylation  
 Battery electrolytes  
 Lithiation  
 (new lithium salts for rechargeable battery electrolytes)

IT Sulfones  
 RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation);  
 PREP (Preparation); RACT (Reactant or reagent)  
 (new lithium salts for rechargeable battery electrolytes)

IT Solubility  
 (of lithium imide salts in carbonate solvents, DMSO, and sulfolane; new lithium salts for rechargeable battery electrolytes)

IT Electric impedance  
 (of lithium salt solns. in DMSO; new lithium salts for rechargeable battery electrolytes)

IT Electric conductivity  
 (of salts in solvents; new lithium salts for rechargeable battery electrolytes)

IT Imides  
 Sulfonic acids, preparation  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (sulfonimides; new lithium salts for rechargeable battery electrolytes)

IT Decomposition  
 (temperature of; new lithium salts for rechargeable battery electrolytes)

IT 67-68-5, DMSO, uses 96-49-1, Ethylene carbonate 126-33-0, Sulfolane 616-38-6, Dimethyl carbonate  
 RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)  
 (new lithium salts for rechargeable battery electrolytes)

IT 21324-40-3, Lithium hexafluorophosphate  
 RL: PRP (Properties)  
 (new lithium salts for rechargeable battery electrolytes)

IT 1070-92-4P 1750-62-5P 4610-99-5P  
 90325-14-7P  
 RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation);  
 PREP (Preparation); RACT (Reactant or reagent)  
 (new lithium salts for rechargeable battery electrolytes)

IT 59099-56-8P 133395-17-2P 259106-93-9P 847684-90-6P  
 847684-93-9P 847684-94-0P 847684-96-2P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (new lithium salts for rechargeable battery electrolytes)

IT 75-08-1, Ethanethiol 110-88-3, 1,3,5-Trioxane, reactions  
 124-63-0, Methanesulfonyl chloride 420-04-2, Cyanamide 594-44-5,  
 Ethanesulfonyl chloride 598-30-1, sec-Butyl Lithium  
 917-54-4, Methyl lithium 1310-65-2, Lithium hydroxide  
 1618-26-4, Bis(methylthio)methane 7646-69-7, Sodium hydride (NaH)  
 7722-84-1, Hydrogen peroxide, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (new lithium salts for rechargeable  
 battery electrolytes)

IT 15873-42-4P, Imidodisulfuryl chloride 34782-37-1P 34782-38-2P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation);  
 RACT (Reactant or reagent)  
 (new lithium salts for rechargeable  
 battery electrolytes)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L54 ANSWER 6 OF 12 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2004:161244 HCPLUS Full-text  
 DOCUMENT NUMBER: 140:202430  
 TITLE: Salts of pentacyclic or tetrapentalene derived  
 anions, and their uses as ionic conductive  
 materials  
 INVENTOR(S): Armand, Michel; Michot, Christophe; Gauthier,  
 Michel; Choquette, Yves  
 PATENT ASSIGNEE(S): Hydro-Quebec, Can.; Centre National De La  
 Recherche Scientifique (CNRS)  
 SOURCE: Eur. Pat. Appl., 33 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: French  
 FAMILY ACC. NUM. COUNT: 5  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1391952	A2	20040225	EP 2003-292436	199712 30
CA 2194127	A1	19980630	CA 1996-2194127	199612 30
CA 2199231	A1	19980905	CA 1997-2199231	199703 05
EP 850933	A1	19980701	EP 1997-403188	199712 30
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
CA 2248304	A1	19980709	CA 1997-2248304	199712 30
CA 2248304	C	20071113		
EP 889863	A2	19990113	EP 1997-951051	199712 30

EP 889863	B1	20030507		
R: DE, FR, GB, IT				
EP 890176	A1	19990113	EP 1997-951052	199712 30
EP 890176	B1	20010620		
R: DE, FR, GB, IT				
JP 2000508114	T	20000627	JP 1998-529517	199712 30
JP 2000508346	T	20000704	JP 1998-529516	199712 30
JP 2000508676	T	20000711	JP 1998-529514	199712 30
JP 2000508677	T	20000711	JP 1998-529515	199712 30
JP 2000508678	T	20000711	JP 1998-529518	199712 30
JP 2002514245	T	20020514	JP 1998-529513	199712 30
US 6120696	A	20000919	US 1998-125792	199808 28
US 6171522	B1	20010109	US 1998-101811	199811 19
US 6333425	B1	20011225	US 1998-101810	199811 19
US 6228942	B1	20010508	US 1998-125798	199812 02
US 6395367	B1	20020528	US 1998-125799	199812 02
US 6319428	B1	20011120	US 1998-125797	199812 03
US 6365068	B1	20020402	US 2000-609362	200006 30
US 6576159	B1	20030610	US 2000-638793	200008 09
US 2001024749	A1	20010927	US 2001-826941	200104 06
US 6506517	B2	20030114		
US 2002009650	A1	20020124	US 2001-858439	200105 16
US 2002102380	A1	20020801	US 2002-107742	200203 27
US 6835495	B2	20041228		

US 2003052310	A1	20030320	US 2002-253035	200209 24
US 2003066988	A1	20030410	US 2002-253970	200209 24
US 2005074668	A1	20050407	US 2004-789453	200402 27
US 2005123831	A1	20050609	US 2004-926283	200408 25
PRIORITY APPLN. INFO.:			CA 1996-2194127	A 199612 30
			CA 1997-2199231	A 199703 05
			EP 1997-403188	A3 199712 30
			WO 1997-CA1008	W 199712 30
			WO 1997-CA1009	W 199712 30
			WO 1997-CA1010	W 199712 30
			WO 1997-CA1011	W 199712 30
			WO 1997-CA1012	W 199712 30
			WO 1997-CA1013	W 199712 30
			US 1998-101810	A3 199811 19
			US 1998-101811	A3 199811 19
			US 1998-125798	A3 199812 02

US 1998-125799	A3
	199812
	02
US 1998-125797	A1
	199812
	03
US 2000-638793	A1
	200008
	09
US 2001-858439	A1
	200105
	16
US 2002-107742	A1
	200203
	27

AB This invention describes ionic compds. where the anionic charge is delocalized. One compound of the invention contains an anionic part associated with at least one mono- or multivalent cationic part  $Mm^+$ , in a number sufficient to ensure electronic neutrality of the material. M can be a hydronium, nitrosyl  $NO_+$ , an ammonium  $NH_4^+$ , a metallic cation with valence m, an organic cation having a valence m, or an organometallic cation having valence m. The anionic charge is carried by a new pentacyclic moiety or derivative of tetrapentalene carrying electroattractive substituents. The compds. are used notably for ionic conduction, electronic conductors, dyes and colorants, and catalysts for diverse chemical reactions. They can also be used as electrolytes in fuel cells and batteries.

IT 210469-91-3P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

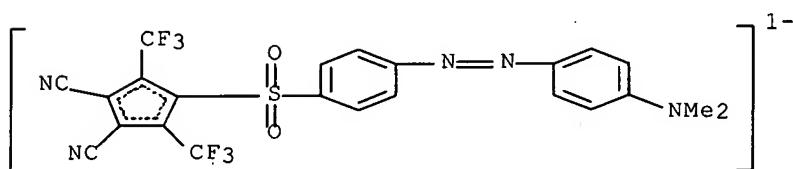
RN 210469-91-3 HCAPLUS

CN 1-Butanaminium, N,N,N-tributyl-, salt with 4-[[4-[(4-(dimethylamino)phenyl)azo]phenyl]sulfonyl]-3,5-bis(trifluoromethyl)-1,3-cyclopentadiene-1,2-dicarbonitrile (1:1) (9CI) (CA INDEX NAME)

CM 1

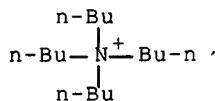
CRN 210469-90-2

CMF C23 H14 F6 N5 O2 S

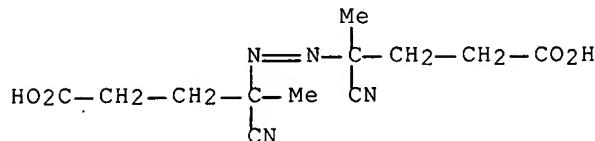


CM 2

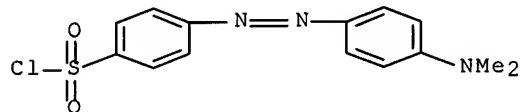
CRN 10549-76-5  
 CMF C16 H36 N



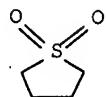
IT 2638-94-0, 4,4'-Azobis(4-cyanovaleic acid)  
 56512-49-3, 4-(Dimethylamino)azobenzene  
 -4'-sulfonyl chloride  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (salts of pentacyclic or tetrapentalene derived anions,  
 and their uses as ionic conductive materials)  
 RN 2638-94-0 HCPLUS  
 CN Pentanoic acid, 4,4'-(1,2-diazenediyl)bis[4-cyano- (CA INDEX NAME)



RN 56512-49-3 HCPLUS  
 CN Benzenesulfonyl chloride, 4-[2-[4-(dimethylamino)phenyl]diazenyl]-  
 (CA INDEX NAME)



IT 126-33-0D, Sulfolane, derivs.  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (solvent for title compds.; salts of pentacyclic or  
 tetrapentalene derived anions, and their uses as ionic conductive  
 materials)  
 RN 126-33-0 HCPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M006-16  
 ICS H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST Section cross-reference(s): 27, 28, 29, 35, 76

ST pentacyclic tetrapentalene salt charge delocalized anion ionic conduction; alkali alk earth transition metal salt heterocyclic **electrolyte** polymer; electrochem cell fuel polyelectrolyte cond soly catalysis fluoropolymer polysiloxane

IT Optical absorption  
(by polymer **electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Carbon black, uses  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(composite electrodes with soft polymer or LiCoO<sub>2</sub> and polymer gel **electrolytes**, or with acetylene black, VO<sub>2</sub> and PEO; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Polyoxyalkylenes, processes  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)  
(**electrolyte** complexes with lithium salts, carbon blacks, (1,2,3-triazolium) ionic liqs., and other materials; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Phosphates, uses  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(iron, manganese, and lithium -containing; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Open circuit potential  
(of dye-sensitized solar cells with imidazolium-triazole-iodide **electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Ionic conductivity  
(of lithium salts in polymer **electrolytes** and polymer gel **electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Cyclic voltammetry  
(of secondary battery cells with polymer gel **electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Silicates, uses  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(phospho-, iron, manganese, and lithium -containing; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Aldol condensation catalysts  
Antistatic agents  
Coloring materials  
Corrosion inhibitors  
Dyes  
Electron delocalization  
Esterification  
Friedel-Crafts reaction catalysts  
Fuel cell separators  
Heterojunction solar cells  
Ionic liquids  
Michael reaction catalysts  
Plasticizers

Polyelectrolytes  
 Polymer electrolytes  
 Polymerization catalysts  
 Solubility  
 Substitution reaction, nucleophilic  
 Surfactants  
 (salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Phosphates, uses  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (silico-, iron, manganese, and lithium -containing; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 25322-68-3, Polyethylene oxide  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)  
 (electrolyte complexes with lithium salts, carbon blacks, (1,2,3-triazolium) ionic liqs., and other materials; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210289-62-6P  
 RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)  
 (electrolyte, ionic liquid; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate  
 RL: PRP (Properties)  
 (in gel polymer electrolyte; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 107-13-1, Acrylonitrile, reactions  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (in gel polymer electrolyte; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 661461-54-7P  
 RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)  
 (pure and polymer electrolytes with polyethylene oxide; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 7580-67-8, Lithium hydride  
 RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
 (salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>)  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 289-06-5D, Thiadiazole, anionic derivs. 289-95-2D, Pyrimidine, anionic derivs. 290-37-9D, Pyrazine, anionic derivs. 7439-93-2, Lithium, uses 11120-54-0D, Oxadiazole, anionic derivs.  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210469-91-3P 661461-52-5P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 76-05-1, reactions 78-94-4, Methyl vinyl ketone, reactions 94-41-7 98-88-4, Benzoyl chloride 100-52-7, Benzaldehyde, reactions 100-66-3, Anisole, reactions 102-52-3, 1,1,3,3-Tetramethoxypropane 106-20-7, Di-2-ethylhexylamine 108-24-7, Acetic anhydride 109-72-8, Butyllithium, reactions 110-61-2, Succinic dinitrile 112-76-5, Stearic acid chloride 121-44-8, Triethylamine, reactions 143-33-9, Sodium cyanide 144-55-8, Sodium bicarbonate, reactions 303-04-8, 2,3-Dichloro-Hexafluoro-2-butene 326-90-9, 4,4,4-Trifluoro-1-(2-furyl)-1,3-butanedione 326-91-0 375-72-4, Perfluorobutanesulfonyl fluoride 407-38-5, 2,2,2-Trifluoroethyl trifluoroacetate 421-83-0, Trifluoromethanesulfonyl chloride 497-19-8, Sodium carbonate, reactions 538-75-0, Dicyclohexylcarbodiimide 542-92-7, Cyclopentadiene, reactions 554-13-2, Lithium carbonate 584-08-7, Potassium carbonate 676-58-4, Methylmagnesium chloride 677-25-8, Ethenesulfonyl fluoride 692-50-2 693-13-0, 1,3-Diisopropylcarbodiimide 764-93-2, 1-Decyne 765-12-8, Triethylene glycol divinyl ether 917-70-4, Lanthanum acetate 937-14-4, 3-Chloroperoxybenzoic acid 1000-84-6 1068-57-1, Acetylhydrazide 1122-28-7, 4,5-Dicyanoimidazole 1310-58-3, Potassium hydroxide, reactions 1522-22-1, Hexafluoroacetylacetone 1643-19-2, Tetrabutylammonium bromide 1648-99-3 2094-98-6, 1,1'-Azobis(cyclohexanecarbonitrile) 2582-30-1, 1-Aminoguanidine bicarbonate 2633-67-2, 4-Styrenesulfonyl chloride 2638-94-0, 4,4'-Azobis(4-cyanovaleric acid) 2893-78-9, Dichloroisocyanuric acid, sodium salt 3804-23-7, Scandium acetate 4546-95-6, 1,2,3-Triazole-4,5-dicarboxylic acid 7447-41-8, Lithium chloride, reactions 7647-01-0, Hydrochloric acid, reactions 7647-14-5, Sodium chloride, reactions 7664-39-3, Hydrofluoric acid, reactions 7757-82-6, Sodium sulfate, reactions 7758-09-0, Potassium nitrite 7782-50-5, Chlorine, reactions 7789-23-3, Potassium fluoride 9002-92-0, Brij 30 13360-57-1 13637-84-8, Chlorosulfonyl fluoride 13781-67-4, 2-(3-Thienyl)ethanol 14635-75-7, Nitrosonium tetrafluoroborate 16090-14-5 17455-13-9, 18-Crown-6 17587-22-3, 1,1,1,2,2,3,3-Heptafluoro-7,7-dimethyl-4,6-octanedione 20583-66-8, 1,1,1,5,5,6,6,7,7,7-Decafluoro-2,4-Heptanedione 26628-22-8, Sodium azide 27070-49-1, 1,2,3-Triazole 31469-15-5, 1-Methoxy-1-(trimethylsilyloxy)-2-methyl-1-propene 39262-22-1 39377-49-6, Copper cyanide 53188-07-1, Trolox 56512-49-3, 4-(Dimethylamino)azobenzene-4'-sulfonyl chloride 65039-09-0, 1-Ethyl-3-methyl-1H-imidazolium chloride 66051-48-7 77968-17-3 81850-46-6 81850-47-7 89183-45-9, Polyaniline hydrochloride 210049-00-6 210289-26-2 210289-55-7 210469-93-5 661461-58-1 661461-61-6

RL: RCT (Reactant); RACT (Reactant or reagent)

(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 126-33-0D, Sulfolane, derivs.

RL: NUU (Other use, unclassified); USES (Uses)

(solvent for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 156118-35-3DP, 2-(5-cyano-1,3,4-triazole)-4,4-difluorobutyl-, lithium salt

RL: PUR (Purification or recovery); SPN (Synthetic preparation);  
 PREP (Preparation)  
 (surfactant and antistatic; salts of pentacyclic or  
 tetrapentalene derived anions, and their uses as ionic conductive  
 materials)

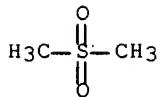
L54 ANSWER 7 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2004:119843 HCAPLUS Full-text  
 DOCUMENT NUMBER: 140:149224  
 TITLE: Nonaqueous **electrolytic** solution with  
 improved safety for lithium  
**battery**  
 INVENTOR(S): Kim, Jun-ho; Lee, Ha-young; Choy, Sang-hoon;  
 Kim, Ho-sung  
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 12 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2004029018	A1	20040212	US 2003-637554	200308 11
US 7105250 KR 2004015420	B2 A	20060912 20040219	KR 2002-47510	200208 12
JP 2004079532	A	20040311	JP 2003-290946	200308 08
CN 1495960	A	20040512	CN 2003-158672	200308 12
PRIORITY APPLN. INFO.:			KR 2002-47510	A 200208 12

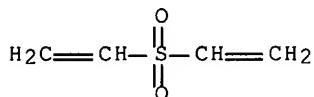
AB A nonaq. **electrolytic** solution and a lithium **battery** employing the same  
 include a lithium salt, an organic solvent, and a halogenated benzene compound  
 The use of the nonaq. **electrolytic** solution causes formation of a polymer by  
 oxidative decomposition of the **electrolytic** solution even if a sharp voltage  
 increase occurs due to overcharging of the battery, leading to consumption of  
 an overcharge current, thus protecting the battery.  
 IT 67-71-0, Methyl sulfone 77-77-0, Vinyl sulfone  
 94-36-0, **Benzoylperoxide**, uses 105-64-6,  
 Diisopropyl **peroxy** dicarbonate 105-74-8, Lauroyl  
**peroxide** 126-33-0, Tetramethylene sulfone  
 127-63-9, Phenyl sulfone 620-32-6, Benzyl sulfone  
 1561-49-5, Dicyclohexyl **peroxy** dicarbonate  
 1712-87-4, m-Toluoyl **peroxide** 3006-82-4,  
 tert-**Butylperoxy**-2-ethylhexanoate 14666-78-5  
 15520-11-3, Bis(4-tert-butylcyclohexyl)  
**peroxydicarbonate** 28452-93-9, Butadiene sulfone  
 32752-09-3, Isobutyl **peroxide** 92177-99-6  
 , 3,3,5-Trimethylhexanoyl**peroxide**

RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. **electrolytic** solution with improved safety for  
 lithium battery)

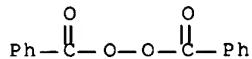
RN 67-71-0 HCAPLUS  
 CN Methane, 1,1'-sulfonylbis- (CA INDEX NAME)



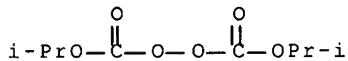
RN 77-77-0 HCAPLUS  
 CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)



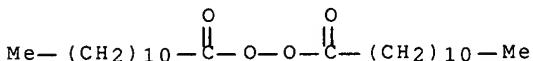
RN 94-36-0 HCAPLUS  
 CN Peroxide, dibenzoyl (CA INDEX NAME)



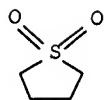
RN 105-64-6 HCAPLUS  
 CN Peroxydicarbonic acid, C,C'-bis(1-methylethyl) ester (CA INDEX  
 NAME)



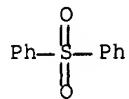
RN 105-74-8 HCAPLUS  
 CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



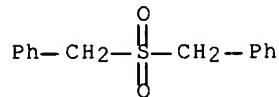
RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



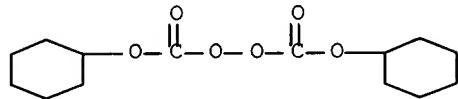
RN 127-63-9 HCAPLUS  
 CN Benzene, 1,1'-sulfonylbis- (CA INDEX NAME)



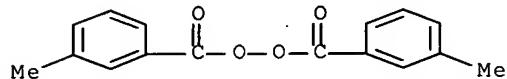
RN 620-32-6 HCAPLUS  
 CN Benzene, 1,1'-[sulfonylbis(methylene)]bis- (CA INDEX NAME)



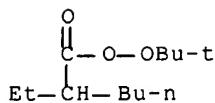
RN 1561-49-5 HCAPLUS  
 CN Peroxydicarbonic acid, C,C'-dicyclohexyl ester (CA INDEX NAME)



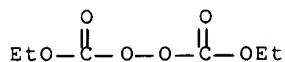
RN 1712-87-4 HCAPLUS  
 CN Peroxide, bis(3-methylbenzoyl) (CA INDEX NAME)



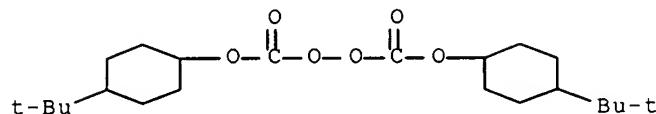
RN 3006-82-4 HCAPLUS  
 CN Hexaneperoxoic acid, 2-ethyl-, 1,1-dimethylethyl ester (CA INDEX NAME)



RN 14666-78-5 HCAPLUS  
 CN Peroxydicarbonic acid, diethyl ester (CA INDEX NAME)



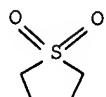
RN 15520-11-3 HCAPLUS  
 CN Peroxydicarbonic acid, C,C'-bis[4-(1,1-dimethylethyl)cyclohexyl] ester (CA INDEX NAME)



RN 28452-93-9 HCAPLUS  
 CN Thiophene, dihydro-, 1,1-dioxide (CA INDEX NAME)

CM 1

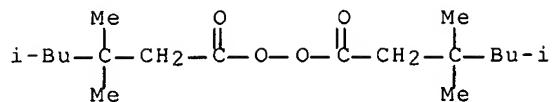
CRN 126-33-0  
 CMF C4 H8 O2 S



RN 32752-09-3 HCAPLUS  
 CN Peroxide, bis(2-methylpropyl) (CA INDEX NAME)

i-Bu-O-O-Bu-i

RN 92177-99-6 HCAPLUS  
 CN Peroxide, bis(3,3,5-trimethyl-1-oxohexyl) (9CI) (CA INDEX NAME)



IC ICM H01M010-40  
 INCL 429326000; 429200000; 429340000; 429331000; 429332000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium battery nonaq electrolyte soln  
 improved safety  
 IT Esters, uses  
 Ethers, uses  
 Hydrocarbons, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (C1-20; nonaq. electrolytic solution with improved safety  
 for lithium battery)  
 IT Aromatic hydrocarbons, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (C5-20; nonaq. electrolytic solution with improved safety  
 for lithium battery)  
 IT Secondary batteries  
 (lithium; nonaq. electrolytic solution with  
 improved safety for lithium battery)  
 IT Battery electrolytes  
 (nonaq. electrolytic solution with improved safety for  
 lithium battery)  
 IT Polyesters, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolytic solution with improved safety for  
 lithium battery)  
 IT Alcohols, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (polyhydric; nonaq. electrolytic solution with improved  
 safety for lithium battery)  
 IT 3087-37-4, Tetrapropyltitanate  
 RL: CAT (Catalyst use); USES (Uses)  
 (nonaq. electrolytic solution with improved safety for  
 lithium battery)  
 IT 502-44-3,  $\epsilon$ -Caprolactone 7439-93-2D, Lithium,  
 salt 12190-79-3, Cobalt lithium oxide colio2  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolytic solution with improved safety for  
 lithium battery)  
 IT 126-58-9DP, Dipentaerythritol, derivative  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (nonaq. electrolytic solution with improved safety for  
 lithium battery)  
 IT 56-81-5, Glycerol, uses 67-71-0, Methyl sulfone  
 71-43-2D, Benzene, halogenated 77-77-0, Vinyl sulfone  
 94-36-0, Benzoylperoxide, uses 96-49-1, Ethylene  
 carbonate 105-64-6, Diisopropyl peroxy  
 dicarbonate 105-74-8, Lauroyl peroxide  
 108-32-7, Propylene carbonate 115-77-5, Pentaerythritol, uses  
 126-33-0, Tetramethylene sulfone 126-58-9,  
 DiPentaerythritol 127-63-9, Phenyl sulfone 456-55-3,  
 Trifluoromethyl phenyl ether 462-06-6, Fluorobenzene

620-32-6, Benzyl sulfone 623-53-0, Ethyl methyl carbonate  
 1561-49-5, Dicyclohexyl **peroxy** dicarbonate  
 1712-87-4, m-Toluoyl **peroxide** 2972-19-2  
 3006-82-4, **tert-Butylperoxy**-2-ethylhexanoate  
 9002-88-4, Polyethylene 9003-07-0, Polypropylene  
 14666-78-5 15520-11-3, Bis(4-**tert**-butylcyclohexyl)  
**peroxydicarbonate** 21151-56-4, Benzene,  
 1-chloro-4-(chloromethoxy)- 21324-40-3, Lithium  
 hexafluorophosphate 28452-93-9, Butadiene sulfone  
 32752-09-3, Isobutyl **peroxide** 92177-99-6  
 , 3,3,5-**Trimethylhexanoylperoxide** 130038-50-5,  
 2-Propenoic acid, 2-methyl-, ion(1-) homopolymer, uses 651294-25-6  
 651294-26-7 651294-27-8  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. **electrolytic** solution with improved safety for  
 lithium battery)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR  
 THIS RECORD. ALL CITATIONS AVAILABLE IN  
 THE RE FORMAT

L54 ANSWER 8 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2003:796195 HCAPLUS Full-text  
 DOCUMENT NUMBER: 139:294681  
 TITLE: **Electrolyte** for lithium  
 battery to reduce overcharge and improve  
 electrochemical characteristics  
 INVENTOR(S): Kim, Jun-Ho; Lee, Ha-Young; Choy, Sang-Hoon;  
 Kim, Ho-Sung; Noh, Hyeong-Gon  
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 19 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003190529	A1	20031009	US 2003-393294	200303 21
US 7205073 KR 2003079310	B2 A	20070417 20031010	KR 2002-18264	200204 03
CN 1449070	A	20031015	CN 2003-108529	200303 28
JP 2003297426	A	20031017	JP 2003-100349	200304 03
US 2007212614	A1	20070913	US 2007-714197	200703 06
PRIORITY APPLN. INFO.:			KR 2002-18264	A 200204 03
			US 2003-393294	A3

200303

21

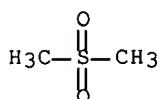
OTHER SOURCE(S): MARPAT 139:294681

AB An **electrolyte** for a **lithium battery** includes a nonaq. organic solvent, a **lithium salt**, and an additive comprising (a) a compound represented by the formula  $[(R1)nC_6H(6-n+m)(X)m]$ , and (b) a compound selected from the group consisting of a sulfone-based compound, a poly(ester)(meth)acrylate, a polymer of poly(ester)(meth)acrylate, and a mixture thereof: wherein R1 is a C1-10 alkyl, a C 1-10 alkoxy, or a C6-10 aryl, and preferably a Me, Et, or methoxy, X is a halogen, and m and n are integers ranging from 1 to 5, where m+n is less than or equal to 6.

IT 67-71-0, Methyl sulfone 77-77-0, Vinyl sulfone  
 94-36-0, Benzoyl peroxide, uses 105-64-6  
 , Diisopropyl peroxy dicarbonate 105-74-8,  
 Lauroyl peroxide 126-33-0, Tetramethylene  
 sulfone 127-63-9, Phenyl sulfone 620-32-6,  
 Benzyl sulfone 1561-49-5, Dicyclohexyl peroxy  
 dicarbonate 1712-87-4, m-Toluoyl peroxide  
 3006-82-4, tert-Butylperoxy-2-ethyl-hexanoate  
 14666-78-5 15520-11-3, Bis(4-tert-butylcyclohexyl)  
 peroxy dicarbonate 28452-93-9, Butadiene sulfone  
 32752-09-3, Isobutyl peroxide 92177-99-6  
 , 3,3,5-Trimethylhexanoyl peroxide  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte for lithium battery to  
 reduce overcharge and improve electrochem. characteristics)

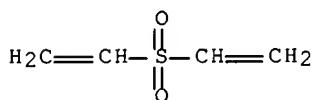
RN 67-71-0 HCAPLUS

CN Methane, 1,1'-sulfonylbis- (CA INDEX NAME)



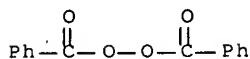
RN 77-77-0 HCAPLUS

CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)



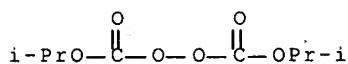
RN 94-36-0 HCAPLUS

CN Peroxide, dibenzoyl (CA INDEX NAME)

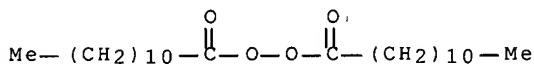


RN 105-64-6 HCAPLUS

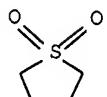
CN Peroxydicarbonic acid, C,C'-bis(1-methylethyl) ester (CA INDEX NAME)



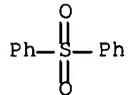
RN 105-74-8 HCAPLUS  
 CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)



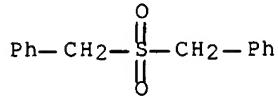
RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



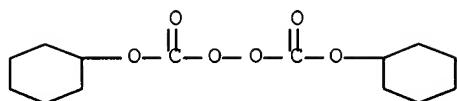
RN 127-63-9 HCAPLUS  
 CN Benzene, 1,1'-sulfonylbis- (CA INDEX NAME)



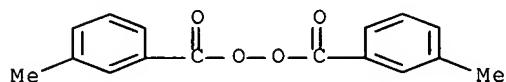
RN 620-32-6 HCAPLUS  
 CN Benzene, 1,1'-[sulfonylbis(methylene)]bis- (CA INDEX NAME)



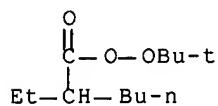
RN 1561-49-5 HCAPLUS  
 CN Peroxydicarbonic acid, C,C'-dicyclohexyl ester (CA INDEX NAME)



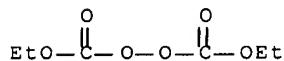
RN 1712-87-4 HCAPLUS  
 CN Peroxide, bis(3-methylbenzoyl) (CA INDEX NAME)



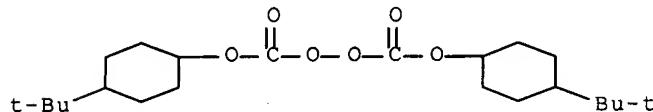
RN 3006-82-4 HCAPLUS  
 CN Hexaneperoxyic acid, 2-ethyl-, 1,1-dimethylethyl ester (CA INDEX NAME)



RN 14666-78-5 HCAPLUS  
 CN Peroxydicarbonic acid, diethyl ester (CA INDEX NAME)



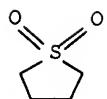
RN 15520-11-3 HCAPLUS  
 CN Peroxydicarbonic acid, C,C'-bis[4-(1,1-dimethylethyl)cyclohexyl] ester (CA INDEX NAME)



RN 28452-93-9 HCAPLUS  
 CN Thiophene, dihydro-, 1,1-dioxide (CA INDEX NAME)

CM 1

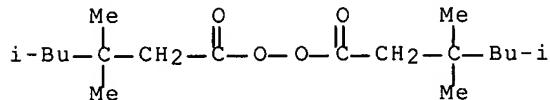
CRN 126-33-0  
 CMF C4 H8 O2 S



RN 32752-09-3 HCAPLUS  
 CN Peroxide, bis(2-methylpropyl) (CA INDEX NAME)

i-Bu—O—O—Bu-i

RN 92177-99-6 HCAPLUS  
 CN Peroxide, bis(3,3,5-trimethyl-1-oxohexyl) (9CI) (CA INDEX NAME)



IC ICM H01M006-18  
 INCL 429307000; 429309000; 429326000; 429322000; 429323000; 429330000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium battery electrolyte overcharge  
 lowering  
 IT Battery electrolytes  
 (electrolyte for lithium battery to  
 reduce overcharge and improve electrochem. characteristics)  
 IT Secondary batteries  
 (lithium; electrolyte for lithium  
 battery to reduce overcharge and improve electrochem.  
 characteristics)  
 IT Peroxides, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (organic; electrolyte for lithium  
 battery to reduce overcharge and improve electrochem.  
 characteristics)  
 IT Alcohols, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (trihydric; electrolyte for lithium  
 battery to reduce overcharge and improve electrochem.  
 characteristics)  
 IT 3087-37-4, Tetrapropyltitanate  
 RL: CAT (Catalyst use); USES (Uses)  
 (electrolyte for lithium battery to  
 reduce overcharge and improve electrochem. characteristics)  
 IT 71-43-2, Benzene, uses 96-49-1, Ethylene carbonate 105-58-8,  
 Diethyl carbonate 108-32-7, Propylene carbonate 108-88-3,  
 Toluene, uses 462-06-6, Fluorobenzene 616-38-6, Dimethyl  
 carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl  
 carbonate 1330-20-7, Xylene, uses 4437-85-8, Butylene carbonate  
 7447-41-8, Lithium chloride (LiCl), uses 7791-03-9, Lithium  
 perchlorate 10377-51-2, Lithium iodide (LiI) 12355-58-7, Lithium  
 aluminate (Li<sub>5</sub>AlO<sub>4</sub>) 14283-07-9, Lithium tetrafluoroborate

18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 27359-10-0, Trifluorotoluene 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate, uses 56525-42-9, Methyl propyl carbonate, uses 90076-65-6 131651-65-5, Lithium perfluorobutanesulfonate

RL: DEV (Device component use); USES (Uses)  
 (electrolyte for lithium battery to  
 reduce overcharge and improve electrochem. characteristics)

IT 126-58-9DP, Dipentaerythritol, reaction product with  $\epsilon$ -caprolactone 502-44-3DP,  $\epsilon$ -Caprolactone, reaction product with dipentaerythritol 609772-45-4P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (electrolyte for lithium battery to  
 reduce overcharge and improve electrochem. characteristics)

IT 56-81-5, Glycerol, uses 67-71-0, Methyl sulfone 77-77-0, Vinyl sulfone 79-10-7D, Acrylic acid,  $\omega$ -fatty acid esters C2-C21 79-41-4D, Methacrylic acid,  $\omega$ -fatty acid esters C2-C21 94-36-0, Benzoyl peroxide, uses 104-92-7, 4-Bromoanisole 105-64-6, Diisopropyl peroxy dicarbonate 105-74-8, Lauroyl peroxide 126-33-0, Tetramethylene sulfone 127-63-9, Phenyl sulfone 149-32-6, Erythritol 452-10-8, 2,4-Difluoroanisole 456-49-5, 3-Fluoroanisole 459-60-9, 4-Fluoroanisole 620-32-6, Benzyl sulfone 623-12-1, 4-Chloroanisole 1561-49-5, Dicyclohexyl peroxy dicarbonate 1712-87-4, m-Toluoyl peroxide 2398-37-0, 3-Bromoanisole 2845-89-8, 3-Chloroanisole 3006-82-4, tert-Butylperoxy-2-ethyl-hexanoate 14666-78-5 15520-11-3, Bis(4-tert-butylcyclohexyl)peroxy dicarbonate 28452-93-9, Butadiene sulfone 32752-09-3, Isobutyl peroxide 92177-99-6, 3,3,5-Trimethylhexanoyl peroxide 93343-10-3, 3,5-Difluoroanisole 202925-08-4, 3-Chloro-5-fluoroanisole 609365-67-5

RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte for lithium battery to  
 reduce overcharge and improve electrochem. characteristics)

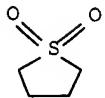
L54 ANSWER 9 OF 12 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2003:727549 HCPLUS Full-text  
 DOCUMENT NUMBER: 139:397889  
 TITLE: Oxygen Transport Properties of Organic  
 Electrolytes and Performance of  
 Lithium/Oxygen Battery  
 AUTHOR(S): Read, J.; Mutolo, K.; Ervin, M.; Behl, W.;  
 Wolfenstine, J.; Driedger, A.; Foster, D.  
 CORPORATE SOURCE: US Army Research Laboratory, AMSRL-SE-DC,  
 Adelphi, MD, 20783-1197, USA  
 SOURCE: Journal of the Electrochemical Society (2003),  
 150(10), A1351-A1356  
 CODEN: JESOAN; ISSN: 0013-4651  
 PUBLISHER: Electrochemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The oxygen transport properties of several organic electrolytes were characterized through measurements of oxygen solubility and electrolyte viscosity. Oxygen diffusion coeffs. were calculated from electrolyte

viscosities using the Stokes-Einstein relation. Oxygen solubility, **electrolyte** viscosity, and oxygen partial pressure were all directly correlated to discharge capacity and rate capability. Substantial improvement in cell performance was achieved through **electrolyte** optimization and increased oxygen partial pressure. The concentration of oxygen in the electrode under discharge was calculated using a semi-infinite medium model with simultaneous diffusion and reaction. The model was used to explain the dependence of cell performance on oxygen transport in organic **electrolyte**.

IT 126-33-0, Tetramethylene sulfone  
 RL: DEV (Device component use); PRP (Properties); RCT (Reactant);  
 RACT (Reactant or reagent); USES (Uses)  
 (electrolyte solvent; oxygen transport properties of  
 organic **electrolytes** and performance of lithium  
 /oxygen battery)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 45, 72, 76

ST oxygen diffusion lithium battery  
 electrolyte solv viscosity oxide capacity

IT Solubility  
 (Bunsen coeffs. of oxygen in solvents and lithium  
 salt/solvent **electrolyte** mixts.; oxygen  
 transport properties of organic **electrolytes** and  
 performance of lithium/oxygen battery)

IT Fluoropolymers, uses  
 RL: DEV (Device component use); TEM (Technical or engineered  
 material use); USES (Uses)  
 (composite cathode with Super P; oxygen transport properties of  
 organic **electrolytes** and performance of lithium  
 /oxygen battery)

IT Primary batteries  
 (lithium; oxygen transport properties of organic  
**electrolytes** and performance of lithium/oxygen  
 battery)

IT Electric impedance  
 (of batteries with various **electrolyte** solns.; oxygen  
 transport properties of organic **electrolytes** and  
 performance of lithium/oxygen battery)

IT Ionic conductivity  
 Viscosity  
 (of lithium salt/solvent **electrolyte**  
 mixts.; oxygen transport properties of organic **electrolytes**  
 and performance of lithium/oxygen battery)

IT Absorption  
 (of oxygen by **electrolyte** solns.; oxygen transport  
 properties of organic **electrolytes** and performance of  
 lithium/oxygen battery)

IT Battery **electrolytes**  
 (oxygen transport properties of organic **electrolytes** and  
 performance of lithium/oxygen battery)

IT Diffusion

(oxygen; oxygen transport properties of organic **electrolytes** and performance of lithium/oxygen **battery**)

IT Electric energy  
 (specific discharge capacity; oxygen transport properties of organic **electrolytes** and performance of lithium/oxygen **battery**)

IT 7440-44-0, Super P, uses  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (activated, composite cathode with PTFE; oxygen transport properties of organic **electrolytes** and performance of lithium/oxygen **battery**)

IT 7429-90-5, Aluminum, uses  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (cathode support and current collectors; oxygen transport properties of organic **electrolytes** and performance of lithium/oxygen **battery**)

IT 9002-84-0, PTFE  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (composite cathode with Super P; oxygen transport properties of organic **electrolytes** and performance of lithium/oxygen **battery**)

IT 7782-44-7, Oxygen, uses  
 RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)  
 (diffusion; oxygen transport properties of organic **electrolytes** and performance of lithium/oxygen **battery**)

IT 21324-40-3, Lithium hexafluorophosphate (LiPF<sub>6</sub>)  
 RL: DEV (Device component use); PRP (Properties); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
 (electrolyte solute; oxygen transport properties of organic **electrolytes** and performance of lithium/oxygen **battery**)

IT 67-68-5, Dimethyl sulfoxide, uses 96-48-0,  $\gamma$ -Butyrolactone  
 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 108-32-7, Propylene carbonate 109-99-9, Tetrahydrofuran, uses  
 110-71-4, 1,2-Dimethoxyethane 112-49-2, Triethylene glycol  
 dimethyl ether 126-33-0, Tetramethylene sulfone  
 143-24-8, Tetraethylene glycol dimethyl ether 616-38-6, Dimethyl  
 carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl  
 carbonate 872-50-4, uses  
 RL: DEV (Device component use); PRP (Properties); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
 (electrolyte solvent; oxygen transport properties of organic **electrolytes** and performance of lithium/oxygen **battery**)

IT 12031-80-0, Lithium peroxide (Li<sub>2</sub>O<sub>2</sub>) 12057-24-8, Lithium oxide (Li<sub>2</sub>O), formation (nonpreparative)  
 RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
 (film formed on cathode to kill discharge; oxygen transport properties of organic **electrolytes** and performance of lithium/oxygen **battery**)

IT 7439-93-2, Lithium, uses  
 RL: DEV (Device component use); USES (Uses)  
 (oxygen transport properties of organic **electrolytes** and performance of lithium/oxygen **battery**)

IT 7440-02-0, Nickel, uses

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(oxygen transport properties of organic **electrolytes** and performance of **lithium/oxygen battery**)

REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 10 OF 12 HCPLUS COPYRIGHT 2007 ACS on STN  
 ACCESSION NUMBER: 2003:656287 HCPLUS Full-text  
 DOCUMENT NUMBER: 139:182872  
 TITLE: **Polymer electrolyte for lithium secondary battery**  
 INVENTOR(S): Jung, Cheol-Soo; Kim, Ki-Ho; Bong, Cul-Hwen; Yang, Doo-Kyung; Lee, Kyoung-Hee; Lee, Yong-Beom; Lim, Hyun-Leong; Yamaguchi, Takitaro; Shimizu, Ryuichi  
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
 SOURCE: U.S. Pat. Appl. Publ., 14 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003157411	A1	20030821	US 2002-287486	200211 05
US 7223501	B2	20070529		
KR 2003068714	A	20030825	KR 2002-8303	200202 16
JP 2003249264	A	20030905	JP 2003-31544	200302 07
CN 1438727	A	20030827	CN 2003-103890	200302 14
PRIORITY APPLN. INFO.:			KR 2002-8303	A 200202 16

AB A solid polymer **electrolyte**, a **lithium battery** employing the same, and methods of forming the **electrolyte** and the **lithium battery** are disclosed. The polymer **electrolyte** includes polyester methacrylate having a polyester polyol moiety having three or more hydroxide (-OH) groups, at least one hydroxide group being substituted by a methacrylic ester group and at least one hydroxide group being substituted by a radical non-reactive group, or its polymer, a **peroxide** having 6-40 carbon atoms, and an **electrolytic** solution including a **lithium salt** and an organic solvent.

IT 94-36-0, **Benzoyl peroxide**, processes

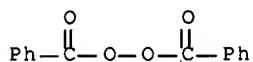
105-74-8, **Lauroyl peroxide**

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(polymer **electrolyte** for **lithium secondary battery**)

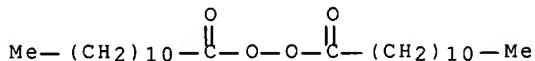
RN 94-36-0 HCPLUS

CN Peroxide, dibenzoyl (CA INDEX NAME)



RN 105-74-8 HCAPLUS

CN Peroxide, bis(1-oxododecyl) (CA INDEX NAME)

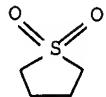


IT 126-33-0, Sulfolane

RL: DEV (Device component use); USES (Uses)  
(polymer electrolyte for lithium secondary  
battery)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40

ICS H01M010-04

INCL 429317000; 429307000; 429316000; 029623100

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 38

ST polymer electrolyte lithium secondary  
battery

IT Aromatic hydrocarbons, uses

RL: MOA (Modifier or additive use); USES (Uses)  
(fluoro; polymer electrolyte for lithium  
secondary battery)

IT Secondary batteries

(lithium; polymer electrolyte for  
lithium secondary battery)

IT Battery electrolytes

Polymer electrolytes  
(polymer electrolyte for lithium secondary  
battery)

IT Polyesters, uses

RL: DEV (Device component use); USES (Uses)  
(polymer electrolyte for lithium secondary  
battery)

IT 3087-37-4, Tetrapropyltitanate

RL: CAT (Catalyst use); USES (Uses)  
(polymer electrolyte for lithium secondary  
battery)

IT 94-36-0, Benzoyl peroxide, processes

105-74-8, Lauroyl peroxide

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(polymer electrolyte for lithium secondary battery)

IT 67-68-5, Dmso, uses 68-12-2, Dmf, uses 75-05-8, Acetonitrile, uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 98-95-3, Nitrobenzene, uses 100-47-0, Benzonitrile, uses 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 108-90-7, Chlorobenzene, uses 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 111-46-6, Diethylene glycol, uses 115-10-6, Dimethyl ether 126-33-0, Sulfolane 127-19-5, Dimethylacetamide 542-52-9, Dibutyl carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 623-96-1, Dipropyl carbonate 646-06-0, Dioxolane 872-36-6, Vinylene carbonate 1072-47-5, 1,3-Dioxolane, 4-methyl 1300-21-6, Dichloroethane 4437-85-8, Butylene carbonate 6482-34-4, Diisopropyl carbonate 7447-41-8, Lithium chloride (LiCl), uses 7791-03-9, Lithium perchlorate 9002-88-4, Polyethylene 9003-07-0, Polypropylene 10377-51-2, Lithium iodide (LiI) 14024-11-4, Aluminum lithium chloride allicl4 14283-07-9, Lithium tetrafluoroborate 18424-17-4, Lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 30714-78-4, Ethyl butyl carbonate 33454-82-9, Lithium triflate 51729-83-0, Methyl isopropyl carbonate 56525-42-9, Methyl propyl carbonate, uses 90076-65-6 131651-65-5

RL: DEV (Device component use); USES (Uses)

(polymer electrolyte for lithium secondary battery)

IT 95-52-3, 2-Fluorotoluene 352-32-9, 4-Fluorotoluene 352-70-5, 3-Fluorotoluene 462-06-6, Benzene, fluoro- 581054-59-3D, mixed acrylic and pentanoic acid esters

RL: MOA (Modifier or additive use); USES (Uses)

(polymer electrolyte for lithium secondary battery)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 11 OF 12 HCPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1999:375786 HCPLUS Full-text

DOCUMENT NUMBER: 131:7556

TITLE: Fire-resistant gas generating battery electrolytes

INVENTOR(S): Narang, Subhash; Ventura, Susanna; Cox, Philip

PATENT ASSIGNEE(S): SRI International, USA

SOURCE: PCT Int. Appl., 36 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

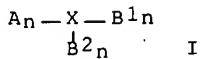
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 9928987	A1	19990610	WO 1998-US25466	199812
				01

W: AL, AM, AT, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU,

CZ, CZ, DE, DE, DK, DK, EE, EE, ES, FI, FI, GB, GE, GH, GM,  
 HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,  
 LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU,  
 SD, SE, SG, SI, SK, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ,  
 VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK,  
 ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,  
 CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG  
 CA 2313027 A1 19990610 CA 1998-2313027 199812  
 01  
 AU 9916161 A 19990616 AU 1999-16161 199812  
 01  
 EP 1042838 A1 20001011 EP 1998-960601 199812  
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 R: DE, GB  
 JP 2001525597 T 20011211 JP 2000-523720 199812  
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 PRIORITY APPLN. INFO.: US 1997-67226P P 199712  
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 WO 1998-US25466 W 199812  
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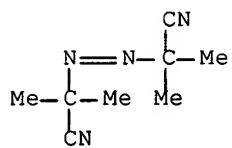


AB A compound that generates a fire-retardant gas upon decomposition has general structure (I) wherein, X is N, C, S, NO, N<sub>2</sub>, CO, SO; A is substantially any organic moiety including alkyl, aryl, alkoxy, cyclic, fused cyclic, heteroatoms, ketals, acetals or alcs. B<sub>1</sub> and B<sub>2</sub> are substantially any organic moiety including alkyl, aryl, alkoxy, cyclic, fused cyclic, heteroatoms, ketals, acetals or alcs., also including oxygen, hydrogen and null; and n is an integer from 0-100. Preferred gases generated thereby include CO, SO<sub>2</sub>, SO<sub>3</sub>, NO, N<sub>2</sub>O, NO<sub>2</sub> and N<sub>2</sub>. It is also preferred that the generated gas assists in formation of a solid electrolyte interface (SEI) between the electrolyte and at least one of the electrodes. It is most preferred that the cell have a conductivity greater than 10<sup>-3</sup> S/cm.

IT 78-67-1, Azobis(isobutyronitrile)  
 25843-45-2, Azoxymethane 28452-93-9,  
 Butadiene sulfone  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte additive; fire-resistant gas generating  
 battery electrolytes)

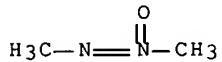
RN 78-67-1 HCAPLUS

CN Propanenitrile, 2,2'-(1,2-diazenediyl)bis[2-methyl- (CA INDEX NAME)



RN 25843-45-2 HCAPLUS

CN Diazene, dimethyl-, 1-oxide (9CI) (CA INDEX NAME)



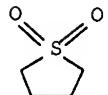
RN 28452-93-9 HCAPLUS

CN Thiophene, dihydro-, 1,1-dioxide (CA INDEX NAME)

CM 1

CRN 126-33-0

CMF C4 H8 O2 S



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery electrolyte fire resistant gas generation

IT Azo compounds

Azoxy compounds

Nitrites

Sulfates, uses

Sulfites

Sulfones

RL: MOA (Modifier or additive use); USES (Uses)

        (electrolyte additive; fire-resistant gas generating  
        battery electrolytes)

IT Battery electrolytes

Fire-resistant materials

(fire-resistant gas generating battery electrolytes)

IT Fluoropolymers, uses

RL: MOA (Modifier or additive use); USES (Uses)

(fire-resistant gas generating battery electrolytes)

IT Secondary batteries

    (lithium; fire-resistant gas generating battery  
    electrolytes)

IT 78-67-1, Azobis(isobutyronitrile) 78-82-0,

Isopropyl nitrile 543-29-3, Isobutyl nitrate 822-38-8, Ethylene  
trithiocarbonate 3741-38-6, Ethylene sulfite 25843-45-2,

Azoxymethane 28322-92-1 28452-93-9, Butadiene

sulfone

RL: MOA (Modifier or additive use); USES (Uses)

(electrolyte additive; fire-resistant gas generating battery electrolytes)

IT 7439-93-2, Lithium, uses 7782-42-5, Graphite, uses 12057-17-9, Lithium manganese oxide limn<sub>2</sub>o<sub>4</sub> 12068-85-8, Iron disulfide 52627-24-4, Cobalt lithium oxide  
RL: DEV (Device component use); USES (Uses)  
(fire-resistant gas generating battery electrolytes)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(fire-resistant gas generating battery electrolytes)

IT 630-08-0, Carbon monoxide, formation (nonpreparative) 7446-09-5, Sulfur dioxide, formation (nonpreparative) 7446-11-9, Sulfur trioxide, formation (nonpreparative) 7727-37-9, Nitrogen, formation (nonpreparative) 10024-97-2, Nitrogen oxide (N<sub>2</sub>O), formation (nonpreparative) 10102-43-9, Nitric oxide, formation (nonpreparative) 10102-44-0, Nitrogen dioxide, formation (nonpreparative)  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(fire-resistant gas generating battery electrolytes)

IT 78-40-0, Triethyl phosphate 24937-79-9  
RL: MOA (Modifier or additive use); USES (Uses)  
(fire-resistant gas generating battery electrolytes)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L54 ANSWER 12 OF 12 HCAPLUS COPYRIGHT 2007 ACS on STN  
ACCESSION NUMBER: 1997:702055 HCAPLUS Full-text  
DOCUMENT NUMBER: 128:13756  
TITLE: Acrylic polyurethane solid electrolyte -formable compositions and manufacture of solid electrolytes using them  
INVENTOR(S): Takiyama, Eiichiro; Matsui, Fumio; Morita, Katsuhisa; Takino, Yukiko; Ogihara, Kazushige; Takahashi, Kentaro  
PATENT ASSIGNEE(S): Showa Highpolymer Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09278971	A	19971028	JP 1996-88528	199604 10
PRIORITY APPLN. INFO.: JP 1996-88528				199604 10

AB The compns. contain (A) monomers having (meth)acryloyl groups and acetoacetoxy groups in a mol., (B) unsatd. polyurethanes obtained by reaction of (meth)acryloyl- and OH-having unsatd. polyesters with isocyanates, (C) Li compds., and (D) solvents which can dissolve the Li compds. The electrolytes are manufactured by polymerization of the above compns., which may be

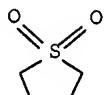
previously partially polymerized to control the viscosity, in a die. The compns. are useful for manufacture of film batteries. Thus, a composition containing AAEM (acetoacetoxyethyl methacrylate) 100, an unsatd. polyurethane [obtained by reaction of Placcel FM 5 with MOI (isocyanatoethyl methacrylate)] 15, propylene carbonate 185, LiBF<sub>4</sub> 30, and benzoyl peroxide 2 parts was casted between 2 Pt electrode plate and polymerized at 80-100° for 2 h under N flow to give a soft gelatin-like polymer film with elec. conductivity 2.1 + 10<sup>-4</sup> S/cm.

IT 126-33-0, Sulfolane

RL: NUU (Other use, unclassified); USES (Uses)  
(solvent; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM C08L033-14

ICS C08K003-24; C08L075-14; H01B001-06; H01M006-18; H01M010-40

CC 37-6 (Plastics Manufacture and Processing)

Section cross-reference(s): 52

ST acrylic polyurethane solid **electrolyte** lithium salt; cast polymn acrylic polyurethane solid **electrolyte**; acetoacetoxyethyl acrylate polyurethane lithium salt **electrolyte**; methacrylate acetoacetoxyethyl polyurethane lithium salt **electrolyte**

IT Polyurethanes, preparation

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(acrylic; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT Polymerization

(casting; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT Battery **electrolytes**

(manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT Polyurethanes, preparation

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(polyoxyalkylene-, acrylic; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT Polyelectrolytes

(solid; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT 198956-70-6P 198956-71-7P

RL: IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT 7791-03-9, Lithium perchlorate 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium trifluoromethanesulfonate

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

IT 75-05-8, Acetonitrile, uses 96-48-0,  $\gamma$ -Butyrolactone 108-32-7, Propylene carbonate 110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane

RL: NUU (Other use, unclassified); USES (Uses)

(solvent; manufacture of solid **electrolytes** from acrylic polyurethanes compns. containing acetoacetoxyethyl (meth)acrylate, unsatd. polyurethanes, and Li compds.)

=>